VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a **Major Municipal** permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq. The discharge results from the treatment of domestic & industrial wastewater in a publicly owned treatment works (POTW). Design capacity for the treatment works and therefore the basis of the discharge limitations has changed to 20.0 mgd from 24.0 mgd. This permit action consists of renewal of coverage for a 5-year term, updating of special conditions and continuing effluent limitations for pH, BOD_5, TSS, *E. coli*, TRC, TKN and Ammonia as Nitrogen. The reissuance also includes monitoring for flow, silver and zinc, stormwater monitoring and conditions regarding sewage sludge treated for land application. SIC Code: 4952 Sewerage Systems

1. **Facility Name and Address: Danville - Northside Wastewater Treatment Plant**
   City of Danville, Danville Utilities, 279 Park Avenue, Danville, VA 24541

   Location: 229 Northside Drive, Danville, VA 24540

2. **Permit No: VA0060593** **Existing Permit Expiration Date:** May 23, 2012

3. **Owner Contact:** Barry T. Dunkley, P.E., Director of Water and Wastewater Treatment, City of Danville
   www.danvilleutilities.com (434)799-6473 dunklbt@ci.danville.va.us

   Contract Operator: Severn Trent Environmental Services
   Jerry Shupe, Project Manager at Northside WWTP; (434)799-5137; Jerry.Shupe@STServices.com

4. **Application Complete Date:** December 9, 2011
   Drafted by: Susan K. Edwards Date: May 16, 2013 and Jan. 7, 2014 Blue Ridge Regional Office - Roanoke
   Reviewed By: Bob Tate Date: May 30, 2013 and January 16, 2014
   Public Comment period Dates: From April 18 to May 19, 2014

5. **Receiving Waters Name:**

   Outfall No(s): 001 (POTW) & 002 (stormwater)

Dan River	1-Day, 10-Year Low Flow (1Q10): 173 mgd
River Mile: 53.32	7-Day, 10-Year Low Flow (7Q10): 288 mgd
River Basin: Roanoke River	30-Day, 10-Year Low Flow (30Q10): 371 mgd
River Subbasin: Roanoke River	30-Day, 5-Year Low Flow (30Q5): 422 mgd
Section: 3	1Q10 High Flow (1Q10 wet season): 393 mgd (Jan-May)
Class: III, Non-tidal Piedmont Zones Waters	30Q10 High Flow (30Q10 wet season): 672 mgd (Jan-May)
Special Standards: None	Harmonic Mean Flow (HM): 905 mgd
Tidal: No	303(d) list: Yes (see section 13 for more information)

   Outfall No(s): 003 (stormwater), 004 (stormwater) & 006 (stormwater)

Unnamed tributary to the Dan River	7-Day, 10-Year Low Flow (7Q10): 0.003 mgd
River Mile: 0.18	7Q10 High Flow months: January - May
River Basin: Roanoke River	1-Day, 10-Year Low Flow (1Q10): 0.002 mgd
River Subbasin: Roanoke River	1Q10 High Flow months: January - May
Section: 3	30-Day, 5-Year Low Flow (30Q5): 0.008 mgd
Class: III, Non-tidal Piedmont Zones Waters	30-Day, 10-Year Low Flow (30Q10): 0.006 mgd
Special Standards: None	Harmonic Mean Flow (HM): 0.044 mgd
Tidal: No	303(d) list: Yes (see section 13 for more information)

Outfall No(s): 005 (stormwater)

Pumpkin Creek	7-Day, 10-Year Low Flow (7Q10): 0.08 mgd
River Mile: 0.22	7Q10 High Flow months: January - May
River Basin: Roanoke River	1-Day, 10-Year Low Flow (1Q10): 0.06 mgd
River Subbasin: Roanoke River	1Q10 High Flow months: January - May
Section: 3	30-Day, 5-Year Low Flow (30Q5): 0.18 mgd
Class: III, Non-tidal Piedmont Zones Waters	30-Day, 10-Year Low Flow (30Q10): 0.13 mgd
Special Standards: None	Harmonic Mean Flow (HM): 0.97 mgd
Tidal: No	303(d) list: Yes (see section 13 for more information)

Attachment A contains a copy of the flow frequency determination memorandum.

6. **Operator License Requirements:** Class I

7. **Reliability Class:** Class I

8. **Permit Characterization**:
   ( ) Private ( ) Federal ( ) State (**X**) POTW ( ) PVOTW
   (**X**) Possible Interstate Effect ( ) Interim Limits in Other Document

9. **Wastewater Treatment System:** See **Attachment A** for a copy of the treatment plant flow diagram. The Northside WWTP is in the process of major renovation of the treatment system. The WWTP was constructed in 1976 as a 24-mgd pure oxygen activated sludge plant composed of two parallel 12-mgd treatment trains. The previous VPDES Permit included limits for a 12-mgd discharge tier. Plant components are being renovated to improve operational flexibility to allow adjusting treatment processes to variable influent rates and thereby improve treatment by the plant. The renovations are expected to reduce operating costs. The upgrades, as discussed in the January 2010 PER prepared by AECOM, also take into consideration the potential of future nutrient limitations on the discharge. Changes to the plant reduce the design capacity to 20 mgd from 24 mgd.

   The Phase I improvements are complete. The twin secondary treatment activated sludge basins (Reactor Basins 1 and 2) have been converted from pure-oxygen-fed systems to the use of ambient diffused air. All three influent bar screens have been reworked. The dual flotation grit separators have been converted to high rate primary clarifiers (HRPC). Renovations include refurbishing the four secondary clarifiers. The dual chlorine contact disinfection tanks are followed by sulfur dioxide dechlorination. The 31-port effluent diffuser in the Dan River is discharging the effluent as intended with work performed to unclog ports since the last reissuance. The plant includes septage and industrial wastewater receiving capabilities. During the 2007 Permit term a new liner was installed in the equalization/diversion basin. A vortex grit removal system (VGS) is planned to be added to each HRPC in the future as Phase II plant improvements. VGS work will begin once construction funds accumulate to fund the work.

   Along with changes to the treatment components the WWTP upgrades include installation of numerous slide gates and valves as well as variable speed motors, blowers and pumps. A SCADA system allows the operator to better monitor, isolate and control of the activated sludge blowers from the main control building for improved treatment flexibility. Addition of SCADA telemetry for other plant units is planned in the future.

Outfall	Discharge Source	Treatment	Design Flow
001	Domestic & industrial wastewater from the City of Danville and surrounding areas of Pittsylvania & Halifax Counties in VA and Caswell County, NC. Total population served approx. 53,855	3 influent bar screens, twin high rate primary clarifiers, future vortex grit removal, influent flow monitoring, flow equalization/diversion basin, dual diffused air activated sludge aeration biological reactor basins, 4 secondary clarifiers, gas chlorination, dechlorination (sulfur dioxide gas), effluent monitoring, and discharge to the Dan River via a 31-port diffuser	20 mgd

Industrial Contributors include 4 non-categorical Significant Industrial Users (SIUs) and 3 Categorical Industrial Users (CIUs). The treatment works also receive leachate seepage from a Super Fund site and have done so for years. This seepage is tested to ensure there are no issues with receiving this liquid. More information on these sources is provided in the application package.

Stormwater Outfalls: Stormwater outfalls 002 – 005 are subject to stormwater pollution prevention plan provisions. Stormwater outfall 006 is runoff from the Southside facility non-industrial grassy ditch area between the sludge basins & road. Discharge volumes are dependent on rainfall amounts, the amount of impervious area in the drainage area and the pollution prevention measures in place.

Outfall	Drainage area (acres)	Discharge Source
002	31.1	Stormwater from north and west industrial portions of Northside facility
003	19.9	Stormwater from north and east industrial portions of Northside facility
004	1.0	Stormwater from southeast industrial portions of Southside facility
005	2.0	Stormwater from southwest industrial portions of Northside facility

10. **Sewage Sludge Use or Disposal** Sewage sludge is collected from the secondary clarifiers and treated using various methods described in the VPDES Sewage Sludge Permit Application Form and Sludge Management Plan (SMP). The annual average of sludge generated is 1102 dry metric tons. On site, sludge is stored in two 7.5 MG (million gallon) basins at the Southside WWTP. Sludge operations are handled as part of the treatment plant operations contract with Severn Trent Environmental Services, Inc. (STES). STES subcontracts with Synagro to land apply the biosolids to farm fields in North Carolina. When disposing of sludge sampling is performed to confirm compliance including adequate pathogen and vector attraction reduction. Nuisance odor monitoring is a continuous concern for the sludge operations due to a nearby golf course. Because the land application is in North Carolina there is no land application site information included in the permit application. Danville – Northside WWTP is on DEQ's 2013 listing of facilities with approved sludge treatment for land application. Part of the requirements to be included on this list the facility had to perform PCB monitoring that was below detection.

    The application indicates that the facility meets the criteria of a Class I sludge management facility. The Instructions for the Sludge Application form state a **Class I** sludge management facility is either:

    - Any POTW required to have an approved pretreatment program under Part VII of the VPDES Permit Regulation, 9 VAC 25-31-730 to 900; or
    - Any treatment works treating domestic sewage classified as a Class I sludge management facility by the EPA Regional Administrator in conjunction with the DEQ because of the potential for its sewage sludge use or disposal practices to adversely affect public health and the environment.

    Northside WWTP fits the first criteria.

    Currently **Class B** pathogen reduction in the sludge is used. Pathogen reduction is accomplished through extended detention in the anaerobic treatment basins at the Southside treatment works and verified by Alternative 1 of pathogen reduction methods, monitoring of fecal coliforms. **Option 1** vector attraction reduction is achieved by producing a '38% reduction in volatile solids' by extended anaerobic storage in the sludge basins. The digested sludge in the basins is mixed about a week before and during removal of the material using one or more pumps.

    The application includes one other option for meeting Class B pathogen reduction criteria - lime stabilization. The method includes, Pathogen Reduction Alternative2, O*ption 5*, which requires the addition of lime to raise pH to ≥ 12 s.u.for 2 hours. VAR *Option 6* requires that the pH be raises to 12 s.u. with lime of other alkali, and retained at ≥ 11.5 s.u. for an additional 22 hours. Lime is added as a solid or slurry.

11. **Discharge Location Descriptions**: (outfall 001) Latitude: 36° 33' 38"N Longitude: 79° 21' 47"W

    Outfall 002: 36° 33' 46"N & 79° 21' 57" W
    Outfall 003: 36° 33' 45"N & 79° 21' 43"W
    Outfall 004: 36° 33' 35"N & 79° 22' 10" W
    Outfall 005: 36° 33' 39"N & 79° 22' 26"W
    Outfall 006: 36° 33' 40"N & 79° 22' 17" W

A portion of the USGS topographic map, which indicates the discharge locations, is included in **Attachment A.** Name of USGS Topographic quadrangle: Ringgold (015D)

12. **Material Stored:**

Chemicals stored at the WWTP include caustic, chlorine gas, lime, oxygen, sulfur dioxide, used oil, diesel fuel, and polymer. All materials are stored in bulk with proper containers, secondary containment and labeling. The storm water pollution plan includes a listing of all materials stored and methods of preventing contact with storm water.

13. **Ambient Water Quality Information**:

The Flow Frequency Determination Memorandum has been updated at the discharge points for critical flows of the Dan River, Pumpkin Creek and an unnamed tributary to the Dan River. A copy of the Flow Frequency Memorandum is provided in **Attachment A**.

Background temperature, hardness and pH data are used in water quality based toxic limit evaluation. This data are available from STORET Station 4ADAN053.40. The station is located at river mile 53.40 with the treatment plant discharge at river mile 53.32, thus just 0.08 miles upstream or approximately 420 feet upstream. Sampling at the monitoring station is from the walkway between the Northside and Southside treatment plant properties upstream of the discharge on the Dan River. Data consists of 12 temperature, 11 pH and 5 hardness values collected from January 2007 through November 2008. The 90% and 10% pH values were found to be 8.4 S.U. and 7.0 S.U. respectively. The 90% annual and 90% wet season temperatures were 27.2 ˚C and 19.4 ºC respectively. Hardness data were only monitored from January through September 2007. The mean value of the data is 22.4 mg/l of $CaCO_3$. Please see **Attachment A** for a copy of the STORET data.

Water Quality Management Plan:

The Roanoke River Water Quality Management Plan (WQMP) in 9 VAC 25-720-80 Part B codifies the seasonal non-TMDL waste load allocations for Danville's Northside WWTP for June – October for **Biochemical Oxygen Demand (BOD_5) of 1907 kg/day** and **Total Kjeldahl Nitrogen (TKN) of 1817 kg/day**. See **Attachment A** for a copy of the WQMP table (allocations on page 5 of 5).

303(d) Listed Segments (TMDL):

Danville's Northside WWTP outfall 001 and stormwater outfall 002 discharge to the Dan River watershed (VAC-L60R-01) of the Roanoke River basin. The 2012 List of Category 5 Impaired Waters (303(d) list), approved by EPA on 12/12/13, includes 61.66 miles of the waterbody for mercury (L60R-01-HG) and PCB (L60R-01-PCB) in fish tissue. The impairments cause the segment to fail to support the fish consumption use. The sources of impairment are currently unknown for both pollutants. PCB monitoring using extremely low detection levels for TMDL development has been completed and submitted. TMDLs are scheduled for 2014 for PCB and 2020 for Mercury. The 2012 Impaired Waters Fact Sheets are provided in **Attachment A**.

The Dan River is also impaired for bacteria. The bacterial TMDL has been prepared and approved by EPA on December 8, 2008 and by the State Water Control Board (SWCB) on April 28, 2009. The TMDL has twice been modified and approved by the EPA. The TMDL did not include an *E. coli* bacterial allocation for the discharge from Northside WWTP (outfall 001) or the stormwater outfall 002. See **Attachment A** for an excerpt from the TMDL with the listing of the point sources within the impaired watersheds and allocation table showing the Northside WWTP was not given an allocation in the Dan River segment WLA table. **Attachment A** also includes a page from the 2012 Impaired Waters (Category 4A) TMDL Approved, approved by EPA on 12/12/13, 34.63 miles of the waterbody are listing the bacterial impairment.

Northside WWTP's stormwater outfalls 003 and 004 discharge to an Unnamed Tributary to the Dan River watershed (L60R) of the Roanoke River basin. The 2012 Impaired Waters list does not include the unnamed tributaries for bacterial impairment.

Northside WWTP's stormwater outfall 005 discharges to Pumpkin Creek, watershed of the Roanoke River basin. On the 2012 List of Category 5 Impaired Waters (303(d) list), approved by EPA on 12/12/13, 3.94

miles of the waterbody is listed for benthic impairment. The impairment causes the segment to fail to support the aquatic life use (L60R-02-BEN). The cause of impairment is believed to be urban watershed related. The TMDL is scheduled for 2024. On the 2012 Impaired Waters (Category 4A) TMDL, approved by EPA on 12/12/13, 3.94 miles of the waterbody are listed for bacterial impairment. The impairment causes the segment to fail to support the recreation use. The TMDL for this tributary to the Dan River is scheduled to be completed by 2018. The 2012 Impaired Waters Fact Sheet and page from the 2012 Category 4A list are provided in **Attachment A**.

14. **Antidegradation Review and Comments**: Tier 1 ____ **Tier 2** ✓ Tier 3 ____
The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1, existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.
The antidegradation review begins with Tier determination. The facility discharges treated wastewater via Outfall 001 to the Dan River. This receiving stream has been listed as impaired for bacteria, as well as PCB and mercury in fish tissue. Although the segment fails to meet the use standards due to these impairments the Dan River, at the point of this facility's discharges, is designated as Tier 2. Guidance Memo 00-2011 indicates that bacterial impairment may not be used as a basis for a Tier 1 determination. Likewise, a DEQ Division of Water Quality Programs memo of February, 8, 2005 exempts 'fish consumption advisories, bans, and prohibitions from tier evaluation'. The Tier 2 designation is the same as the previous reissuance and no significant degradation of the existing water quality is allowed.

For purposes of aquatic life protection, "significant degradation" means that no more that 25% the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10% of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The significant degradation baseline (antidegradation baseline) for aquatic life protection is calculated for each pollutant as follows:

0.25 (WQS - existing quality) + existing quality = Antidegradation baseline

The antidegradation baseline for human health protection is calculated for each pollutant as follows:

0.10 (WQS - existing quality) + existing quality = Antidegradation baseline

The "antidegradation baselines" become the new water quality criteria in Tier 2 waters and effluent limits for future expansions or new facilities must be written to maintain the antidegradation baselines for each pollutant.

Effluent limitations are discussed in detail in Section 16. below. The discharge is in compliance with antidegradation requirements set forth in the Water Quality Standard Regulation, 9 VAC 25-260-30. The antidegradation review was conducted as described in Guidance Memorandum 00-2011, dated August 24, 2000, and complies with the antidegradation policy contained in Virginia's Water Quality Standards

15. **Site Visit:** Date: July 3, 2012 Performed by: Susan Edwards
See **Attachment A** for a copy of the site visit memorandum. The most recent water compliance inspection was Oct. 11, 2013. A copy of the inspection report dated Oct. 25, 2013 is available from the regional office.

16. **Effluent Screening and Limitations Development:**

A. **Outfall 001:** A summary table of limits and monitoring requirements for outfall 001 is provided on the next page. A summary of effluent water quality data, wasteload allocation spreadsheets and statistical limit evaluation outputs are provided in **Attachment B**.

Effluent limitations and monitoring requirements for the Northside WWTP are determined by applying Virginia's WQS, Federal Effluent Guidelines 40 CFR 133, best professional judgment, DEQ GM00-2011,

and the VPDES Permit Manual. Final effluent limitations, monitoring frequencies, and their bases are in the table below. Discussion of specific parameters and their limitations follows. Limitations analyses, including the MSTRANTI spreadsheet and reasonable potential analyses (STATS) printouts are in **Attachment B**.

PARAMETER	BASIS FOR LIMIT	DISCHARGE LIMITS				MONITORING REQUIREMENTS	
		MONTHLY AVERAGE	WEEKLY AVERAGE	MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow	NA	NL (mgd)	NA	NA	NL (mgd)	continuous	TIRE
pH	1 & 2	NA	NA	6.0 S. U.	9.0 S. U.	1/day	Grab
Biochemical Oxygen Demand$_5$ (Nov-May)	1	30 mg/l 2200 kg/d	45 mg/l 3400 kg/d	NA	NA	5 days/week	24 HC
Biochemical Oxygen Demand$_5$ (Jun-Oct)	2	25 mg/l 1907 kg/d	37 mg/l 2800 kg/d	NA	NA	5 days/week	24 HC
Total Suspended Solids	1	30 mg/L 2200 kg/d	45 mg/L 3400 kg/d	NA	NA	1/week	24 HC
Chlorine, total residual	2	1.4 mg/L	1.5 mg/L	NA	NA	1/ 2-hours	Grab
E. coli ()	2	126 N/100ml geometric mean	NL	NA	NA	4/month (weekly)	Grab (10am-4pm)
Total Kjeldahl Nitrogen (June – October)	2	24 mg/L 1817 kg/d	36 mg/L 2700 kg/d	NA	NA	2 days/week	24 HC
Ammonia as Nitrogen (June – December)	2	13 mg/L	13 mg/L	NA	NA	1/month	Grab
Silver, dissolved	NA	NA	NA	NA	NL (µg/L)	1/quarter	24 HC
Zinc, dissolved	NA	NA	NA	NA	NL (µg/L)	1/quarter	24 HC

NA = Not applicable
NL = No limitation, monitoring required
TIRE = Totalizing, Indicating & Recording Equipment
S. U. = Standard Units
24 HC = 1 sample/hour composited as a 24-hour composite

Basis for Effluent Limits
1. Technology FEG (see limit development for citation)
2. Water Quality-based Limits
3. Best Professional Judgment (see limit development for explanation)

Effluent Screening

Current Permit: In compliance with the May 24, 2007 VPDES permit effluent data were submitted for parameters for which effluent limitations have already been established. These parameters are BOD_5, Total Suspended Solids, pH, Dissolved Oxygen, chlorine and seasonal monitoring of Total Kjeldahl Nitrogen (TKN). In addition, discharge flow is required to be monitored and reported. A 3-year summary of effluent Discharge Monitoring Report (DMR) data submitted and the current limits is provided in **Attachment B.**

Water Quality Data: Data from the discharge are needed to calculate the wasteload allocations used in evaluating the need for effluent limits or to revise existing limits. Effluent hardness data were taken from the Whole Effluent Toxicity Program bioassay data. These data provided a total of 15 samples of effluent during the term of the permit with the mean hardness of 78.5 mg/l CaCO3. Effluent 90% and 10% pH values were calculated from daily pH values provided by the permittee from October 2010 through September 2012. The 90% and 10% values are 6.4 and 6.0 S.U. respectively. Effluent 90% yearly and wet-season (January – May) temperature values were calculated from daily temperature values provided by the permittee from October 2010 through September 2012. The 90% annual and wet season values are 76 F˚ (24.4 ˚C) and 65 F˚ (18.3 ˚C) respectively.

Application EPA Form 2A, Expanded Effluent Testing Data Effluent screening as part of the EPA Form 2A application was reviewed to determine if there was 'suitable data' for further evaluation of the need to establish Water Quality Based effluent limits. 'Suitable data' is that for which the analysis provided a result above the required parameter quantification level and for which there is a WQS as provided in 9 VAC 25-260-140. A copy of all data submitted are include in the Application, Attachment C, Part D for review. Three sets of results were provided for most parameters listed – one in October 2007 and a pair in September 2011. Parameters that Virginia has a WQS were compared with their quantification level. Application data submitted with results above quantification were: antimony, chromium III, copper, nickel, silver, zinc, cyanide, bromoform, chlorodibromo-methane, chloroform and dichlorobromo-methane. Human Health criteria apply to antimony, bromoform, chlorodibromo-methane, chloroform and dichlorobromo-

methane. That leaves chromium III, copper, nickel, silver, zinc and cyanide for further acute and chronic toxicity limit evaluation. The Virginia WQS for metals are in dissolved form; therefore, only dissolved metals data may be used to set limits but the total metals data may be used to screen that no further monitoring for those metals is needed. **Attachment B** provides a summary of the suitable application data for further evaluation.

EPA Form 2A Part C application testing also provided data on E. coli, $NO_2 + NO_3$, hardness and total dissolved solids. These parameters will also be evaluated and are included in the summary of data from the application.

Water Quality Standards (WQS) monitoring was not required by the 2007 permit. The analysis of the WQS monitoring data submitted for that reissuance indicated there was no suitable data for further analysis. In addition, the plant has experience significantly reduced influent flows and loss of significant industrial contributors from the 2002 reissuance.

Diffuser and Mixing: In February 2006 a request was made to flow-tier the permit at 12 and 24 mgd due to the loss of significant industrial influent flows. A mixing zone analysis model was prepared for the mix associated the diffuser at both 12 and 24 mgd discharge rates. Critical flows of the Dan River have not changed from the 2007 reissuance. Mixing model results were presented in 2006 as Instream Waste Concentrations (IWC) for acute, chronic and ammonia mixing. **Attachment B** includes the mix excerpt from the 2007 Fact Sheet.

With this reissuance the mixing model analysis was incorporated into the assessment of effluent limitations as an interpolation from the IWCs for the 12 mgd and 24 mgd discharge rates to the 20 mgd design flow rate associated with the renovation of the treatment works.

The ratio formula is: $IWC_{20} = IWC_{12} + [(IWC_{24} - IWC_{12}) \times (8/12)]$

IWCs:	12 mgd	24 mgd	20 mgd
Acute	0.096	0.176	0.149
Chronic	0.060	0.114	0.096
Ammonia	0.047	0.091	0.076

The diffuser formula from the mix study is then used to calculate the critical flow values for the wasteload allocation spreadsheet at the 20 mgd design:

The $IWC = Q_e/(Q_r + Q_e)$, where Q_e = the effluent discharge rate and Q_r = the critical river flow

This formula can be restated as: $IWC (Q_r + Q_e) = Q_e$,

$Q_e/IWC = Q_r + Q_e$,

$Q_r = Q_e/IWC - Q_e$

Substituting 20 mgd for Q_e: $Q_r = 20/IWC - 20$

Acute IWC = 0.149	$Q_r = 20/0.149 – 20 = 114$ mgd	(1Q10 flow)
Chronic IWC = 0.096	$Q_r = 20/0.096 – 20 = 188$ mgd	(7Q10 flow)
Ammonia IWC = 0.076	$Q_r = 20/0.076 – 20 = 243$ mgd	(30Q10 annual)

The IWC mix model endpoints are used in the MSTRANTI version 2b spreadsheet. The stream and effluent water quality parameters noted above were input together with the mix calculations to provide wasteload allocations for toxic parameter reasonable potential limit evaluation below.

Effluent Limitations - a summary table of changes to effluent limits from the 2007 reissuance are found at the end of section 21. Monitoring frequencies reductions are discussed following the limit development discussion below.

Conventional Pollutants:

Flow - The design of the facility has changed to **20 million gallons per day** (mgd) from 24 mgd based on renovation of the plant and treatment method. Flow monitoring is continuous by totalizing, indicating and recording equipment in mgd. This monitoring frequency and sample type is in accordance with the VPDES Permit Manual section MN-2 A.4 for this size facility and appropriate for assessment of treatment plant capacity.

pH - The pH limits of **6.0 S.U.** minimum and **9.0 S.U.** maximum are in accordance with the numerical criteria of the Water Quality Standards 9 VAC 25-260-50 as Class III waters and 40 CFR Subpart 133, Secondary Treatment Standards, Subpart 133.102 and are the same as the water quality criteria. The monitoring frequency is set at once per day of a grab sample. This monitoring frequency and sample type are in accordance with the VPDES Permit Manual section MN-2 A.4 for this size facility and should provide enough data for proper assessment of compliance with the effluent limits.

Biochemical Oxygen Demand (BOD_5) & Total Kjeldahl Nitrogen (TKN) – A non-TMDL Water Quality Management Plan (WQMP) found in 9VAC25-720-80 B. contains seasonal BOD_5 and TKN allocations (loads) for the discharge in the waterbody VAW-L60R. The non-TMDL allocations are based on a water quality model that is not available to include in this Fact Sheet for reference. The limits apply June through October. BOD_5 and TKN allocations are not assigned to the discharge for other months of the year in the WQMP. A copy of the WQMP non-TMDL allocations are provided in **Attachment A**.

June through October: The monthly average mass limits of **1907 kg/day** for BOD_5 and **1817 kg/day** for TKN are from the Roanoke River WQMP. The maximum weekly average mass limit of **2800 kg/day** for BOD_5 and **2700 kg/day** for TKN were calculated at 1.5 times the monthly average truncated to two significant digits per GM 06-2016. The associated concentration limits at the 20 mgd design discharge rate are a monthly average and a maximum weekly average of **25 mg/l** and **37 mg/l** for BOD_5 and **24 mg/l** and **36 mg/l** for TKN. Likewise, these calculations were truncated at 2 significant digits based on GM 06-2016.

November through May: The BOD_5 monthly average limits of **30 mg/l** and maximum weekly average **45 mg/l** are based on the Secondary Treatment Standards of the Federal Effluent Guideline 40 CFR 133 and unchanged from the previous permit. The corresponding mass limit are **2200 kg/day** monthly average and **3400 kg/day** maximum weekly average are calculated based on the design flow of 20 mgd and are reduced from the previous permit load limits that were based on a discharge of 24 mgd. Calculations were truncated at 2 significant digits based on GM 06-2016

The monitoring frequency for BOD_5 is set at 5 days/week of a 24-hour composite sample. This monitoring frequency and sample type are in accordance with the VPDES Permit Manual section MN-2 part A.4 for this size facility and should provide enough data for proper assessment of compliance with the effluent limits.

The monitoring frequency for TKN is set at 2 days/week of a 24-hour composite sample. This monitoring frequency is a Best Professional Judgement determination based on the reduced monitoring frequency if the facility was eligible for that provision. The VPDES Permit Manual MN-2 section A.5 addresses reduced monitoring at facilities with excellent compliance histories. As discussed at the end of this section of the Fact Sheet, the Northside WWTP does not qualify for overall reduction in the frequency of monitoring. However, the seasonal TKN limit is based on a WQMP model using an effluent discharge rate of 24 mgd rather than the 20 MDG of this reissuance. The Permittee proposes to rerun the model with updated stream and discharge data. The VPDES Permit Manual part MN-2 section A.5 table recommends monitoring frequency reductions based on the ratio of effluent concentration to the limit. Here the ratio of the monthly average effluent concentration over the last 3 years to the effluent limit concentration from the last permit is 6.58**:**20 mg/L = 33%. The ratio when using the limit of this reissuance is 5.58**:**24 = 27%. The recommended monitoring reduction frequency of section MN-2 part A.5 is from 5 days/week to 2 days/week. The sample type of a 24-hour composite is in accordance with the VPDES Permit Manual section MN-2 part A.4 for this size facility. Both the sample type and frequency should provide enough data for proper assessment of compliance with the effluent limits.

Total Suspended Solids (TSS) - The monthly average limits of **30 mg/l** and maximum weekly average **45 mg/l** are based on the Secondary Treatment Standards of the Federal Effluent Guideline 40 CFR 133. They are unchanged from the previous permit. The corresponding mass limits based on the design flow of 20 mgd are a monthly average of **2200 kg/day** and maximum weekly average **3400 kg/day** are calculated based on the design flow of 20 mgd and are reduced from the previous permit

load limits based on a discharge of 24 mgd. Calculations were truncated at 2 significant digits based on GM 06-2016. The monitoring frequency is 1/week from a 24-hour composite sample. The monitoring frequency is more frequent than recommended by the VPDES Permit Manual section MN-2 part A.4 for this size facility to provide adequate data to assess compliance with the effluent limits. The monitoring frequency required by the 2007 reissuance was 1/day. The VPDES Permit Manual section MN-2 part A.4 requires daily monitoring for TSS only 'for water quality related reasons (e.g. TMDL, special standards or other regulations). Otherwise 1/month is acceptable.'

E. coli bacteria – The Northside WWTP discharges to an impaired segment (on the current 303(d) list) for which a bacterial TMDL has been developed. The discharge was not given an allocation in the EPA approved TMDL. The Water Quality Standards, 9VAC 25-260-170, specify that *E. coli* bacteria shall not exceed a monthly geometric mean of **126 bacteria/100 ml**. Four (4) times per month (weekly) of grab samples collected between 10am and 4pm. The monitoring frequency and sample type are in accordance with the VPDES Permit Manual section MN-2 part A.4 for this size facility and should provide enough data for proper assessment of compliance with the water quality standards for bacteria. This facility uses chlorine for disinfection. Monitoring for toxicity of chlorine is addressed below. If the method of disinfection changes from chlorination the monitoring frequency for *E. coli* increases to once per day as specified in Part I.B of the Permit.

Toxics: The agency's current Waste Load Allocation (WLA) (MSTRANTI 2b) spreadsheet was prepared for the 20 mgd plant flow using the mixing information from the diffuser mix and water quality data for both the effluent and the Dan River. The WLA's from the spreadsheet are used in the statistical reasonable potential limit evaluation of suitable data as identified from application and WQS monitoring data. The spreadsheet and printouts from the statistical evaluation program (STATS) for each parameter evaluated are included in **Attachment B**.

Ammonia – Pairs of acute and chronic WLA values from the MSTRANTI WLA spreadsheet were used to evaluate the reasonable potential for exceedance of the WQS using the agency's STATS.exe statistical program. The evaluation considered acute and chronic toxicity for both the seasonal high flow months (January – May) and the yearly low flow months (June – December). In accordance with GM 00-2011, in order to force a limit calculation, a single datum of 9 mg/l was used for ammonia.

During the lower flow period **(June – December)** the evaluation indicated the need for limits to protect for ammonia toxicity of **13 mg/l** as both the monthly average and weekly average. The limit is given to 2 significant figures in accordance with GM 02-2016. The evaluation during the high flow season (January – May) indicates no ammonia limit is needed.

The monitoring frequency is set at once per month from a grab sample. This monitoring frequency and sample type are in accordance with VPDES Permit Manual MN-2 A.4 for this size facility and should provide enough data to assess compliance with the effluent limits.

Total Residual Chlorine (TRC) - Acute and chronic WLA values from MSTRANTI WLA spreadsheet were used to evaluate the reasonable potential for exceedance of the WQS using the agency's STATS.exe statistical program. In accordance with GM 00-2011 and the VPDES Permit Manual MN-2 section B.1.d a default datum of 20 mg/L is used in the STATS.exe software to force a limit calculation for TRC. Limits are **1.4 mg/l** as the monthly average and **1.5 mg/l** as the weekly average. The limits are less stringent than the final limits of the 2007 reissuance but are acceptable to revise because they are due to reevaluation with a reduction in design capacity from 24 mgd to 20 mgd. The monitoring frequency is set at once per 2-hours and the sample type is grab (required for chlorine). This monitoring frequency and sample type are in accordance with VPDES Permit Manual MN-2 A.4 for this size facility and should provide adequate data to assess compliance with the effluent limits.

Permit Part I.B describes internal chlorine monitoring requirements. The internal chlorine monitoring frequency remains at once per 2 hour intervals, per MN-2 A.4. However, this permit includes independent monitoring of each chlorine contact tank, enhancing disinfection control. No more than 36 of all samples taken at the outlet of each chlorine contact tank shall be less than 1.0 mg/l for any

one calendar month. No TRC sample collected at the outlet of each chlorine contact tank shall be less than 0.60 mg/l. The DMR contain separate lines for each contact tank.

Chromium III - There are seven total chromium III data points from the EPA Form 2A application. The acute and chronic WLAs from the MSTRANTI 2a spreadsheet were entered into the STATS.exe software along with the data. The software indicated that no limit is needed for Chromium III.

Copper - There are seven total copper data points from the EPA Form 2A application. The acute and chronic WLAs from the MSTRANTI 2a spreadsheet were entered into the STATS.exe software along with the data. The software indicated that no limit is needed for copper.

Nickel - There are seven total nickel data points from the EPA Form 2A application. The acute and chronic WLAs from the MSTRANTI 2a spreadsheet were entered into the STATS.exe software along with the data. The software indicated that no limit is needed for nickel.

Silver - There are seven total silver data points from the EPA Form 2A application. The acute and chronic WLAs from the MSTRANTI 2a spreadsheet were entered into the STATS.exe software along with the data. The software indicated that a limit is needed for silver. However, because the Virginia water quality standards (WQS) for metals are in terms of dissolved data and the data used in the evaluation was total recoverable the conclusion is that a limit is not needed but that additional monitoring data is needed for silver as dissolved metals for further analysis. Monitoring is quarterly using a 24-hour composite sample. This monitoring frequency and sample type should provide enough data for future reasonable potential evaluation.

Zinc - There are seven total zinc data points from the EPA Form 2A application. The acute and chronic WLAs from MSTRANTI 2a spreadsheet were entered into the STATS.exe software along with the data. The software indicates a limit will be needed. But as noted for silver the data used in the evaluation is total recoverable metals rather than dissolved fraction which the WQS are written. Therefore, monitoring for dissolved zinc will be required. Monitoring will be quarterly using a 24-hour composite sample. This monitoring frequency and sample type should provide enough data for future reasonable potential evaluation.

Cyanide - There are 3 total cyanide data points from the EPA Form 2A application. The acute and chronic WLAs from the MSTRANTI 2a spreadsheet were entered into the STATS.exe software along with the data. The software indicated that no limit is needed for cyanide.

PCB – the receiving stream is impaired for PCB in fish tissue. Northside WWTP tested for PCBs in the effluent using the EPA Method 1668B October 19, 20, 24, and 25, November 3 and 4, 2011. The samples of October 19, 20 and November 4, 2011 were from discharges impacted by stormwater. Results were submitted to the Central Office PCB coordinator. No further sampling for PCBs is required for outfall at this time. However, TMDL compliance monitoring may be added during the permit term if needed once the TMDL is completed.

Toxic parameters with only Human Health WLAs (antimony, bromoform, chlorodibromo-methane, chloroform and dichlorobromo-methane) - In accordance with DEQ Advice Memorandum dated January 10, 2001, human health parameters are assumed to be distributed similarly to other parameters and have the same relative variance (C.V. of about 0.6). The effluent data for these parameters, 3 for each parameter, and associated Human Health WLAs were used as input in the Agency's STATS program as acute and chronic WLAs to determine if a limit is needed. The STATS program output indicates that a limit is not needed for any of these parameters.

Mercury – The receiving stream is impaired for mercury in fish tissue. The impairment was listed in 2012 with the TMDL scheduled to be prepared in 2020. During the 2007 permit term the effluent has been sampled for mercury seven times. Data are included in the application and all were below the method detection level used of 2 µg/L. No additional effluent testing for the TMDL development is included in the permit. However, a TMDL reopener special condition is included that allows requiring additional testing if needed for TMDL development.

Whole Effluent Toxicity (WET) - In accordance with 1993 Toxics Management Program Implementation Guidance and GM 00-2012, all publicly owned wastewater treatment plants (POTW's) permitted as a major municipal facility, design flow rates ≥ 1.0 mgd, are required to have

a WET program included in their permit. In addition, all municipal major permits are required to submit testing as part of the EPA Form 2A application for reissuance so that no matter how well they perform during the previous term the on-going WET testing will be needed at the next application for reissuance. The discharge has performed WET testing since 1994. With the significant change in industrial contribution prior to the 2007 reissuance toxicity results are reviewed specifically since that time:

	Acute		Chronic	
	Invertebrate *C. dubia* (water flea)	Vertebrate *P. promelas* (fathead minor)	Invertebrate *C. dubia* (water flea)	Vertebrate *P. promelas* (fathead minor)
Test Period	LC_{50}% / TU_a	LC_{50}% / TU_a	NOEC% / TU_c	NOEC% / TU_c
July 2007	> 100 / < 1	> 100 / < 1	100 / 1	17 / 5.88
Sept. 2008	> 100 / < 1	89.1 / 1.12		
Dec. 2009	> 100 / < 1	> 100 / < 1		
Jan. 2010			17 / 5.88	17 / 5.88
Nov. 2010	> 100 / < 1	> 100 / < 1	41 / 2.44	100 / 1
Nov. 2011	> 100 / < 1	> 100 / < 1	41 / 2.44	100 / 1
Nov 2012	> 100 / < 1	> 100 / < 1	41 / 2.44	100 / 1
Nov 2013	> 100 / < 1	> 100 / < 1	41 / 2.44	100 / 1

A WETLIM10 spreadsheet was prepared for the 20 mgd discharge rates. In the WETLIM10 spreadsheet the Instream Waste Concentration (IWC) for the 20 mgd discharge rate is a proportion of the rate used in the 2007 between the 12 mgd and 24 mgd rate at 9.33%. A copy of the WETLIM10 spreadsheet is included in **Attachment B**. The acute and chronic WLAs from the spreadsheet were used with the TU_c values from the chronic *C. dubia* results since January 2010. The statistical evaluation determined that no limit is needed at this time. A copy of the results of the statistical evaluation is provided in **Attachment B**.

This reissuance will require **4 semi-annual chronic testing with both species** - *Pimephales promelas* and *Ceriodaphnia dubia* in 2015 and 2016. The special condition uses agency wording for facilities that are continuing testing but will require semi-annual testing rather than annual testing. Testing is early in the term so that if toxicity is present additional bioassays may be performed for reasonable potential evaluation at the next renewal. The special condition wording requires reporting of the LC50 at 48 hours and the IC25 as an indication of acute toxicity rather than performing the additional two species acute testing. The WETLIM10 testing endpoints are:

Chronic NOEC = 7% (14.28 TU_c) [Acute $LC_{50} \geq 64\%$ (1.56 TU_a)]

Recommended dilutions for testing are: 100, 39.4, 15.5, 6.1, 2.41% effluent and control.

Monitoring

Monitoring frequencies and sample types are in accordance with guidance for this size facility as given in the VPDES permits manual section MN-2 A.4 except as indicated in the discussion of the specific parameter above for the seasonal TKN and the TSS limitation. The frequencies and sample types should provide enough data to assess compliance with the effluent limits.

Monitoring Frequency Reduction

The VPDES Permit Manual MN-2 section A.5 addresses reduced monitoring at facilities with excellent compliance histories. To qualify for consideration of reduced monitoring, the facility should not have been issued any Warning Letters (WLs), Notice of Violation (NOVs), or related enforcement documents during the past three years. There have been numerous enforcement letters over the past three years. A Letter of Agreement was signed with DEQ on November 9, 2012 regarding the upgrades/renovations to the treatment works. Agency Guidance for consideration of reduced monitoring frequency rates states "If an upgraded facility replaces one that was under an enforcement action, the new facility can be considered for monitoring reduction after it produces 3 years of effluent data." Although it is believed the renovation of the treatment plant will improve the ability to manage the treatment processes and the effluent quality, until a three-year period of clean compliance records are available the monitoring

frequency will not be reduced except for TKN. The TKN monitoring frequency was reduced from that recommended in MN-2 section A.4 to 2/week rather than 5-7/week. Please see TKN limit discussion.

B. **Stormwater Outfalls 002, 003, 004 & 005:** A summary table of monitoring requirements is below.

PARAMETER	BASIS FOR MONITORING	DISHARGE LIMITS		MONITORING REQUIREMENTS	
		MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
pH	1	NA	NL (S. U.)	1/6 months	Grab
Total Suspended Solids	3	NA	NL (mg/L)	1/6 months	Grab
Phosphorus, total	3	NA	NL (mg/L)	1/6 months	Grab
Nitrogen, total	1	NA	NL (mg/L)	1/6 months	Grab
E. coli (N/100ml)	1 & 2	NA	235 N/100 ml	1/6 months	Grab

NA = Not applicable
NL = No limit, monitoring required
S. U. = Standard Units

Basis for Effluent Monitoring/Limits (see limit development for citation)
1. VPDES Industrial SW GP (9 VAC 25-151)
2. TMDL monitoring
3. Best Professional Judgement (BPJ) monitoring

Effluent Screening

Screening of effluent and permit requirements are based on the 2014 VPDES General Permit for Stormwater Associated with Industrial Activity (IndSWGP) 9 VAC 25-151, Guidance Memo (GM) 09-008 and the VPDES Permit Manual part IN-4. Stormwater discharge quality is an indicator of the adequacy of pollution prevention measures to control potential stormwater contamination from site activities. The 2007 permit did not require stormwater monitoring. EPA Form 2F stormwater data for a September 2008 stormwater event was submitted. A summary of the data for outfalls 002, 003, 004 and 005 is in **Attachment B**. The single event grab and composite stormwater data are compared to 'Benchmark Concentration' values of the IndSWGP and the Virginia Water Quality Standard for *E. coli*. Data for pH, temperature, DO, BOD_5, COD, Total Phosphorus and Oil & Grease are not above the benchmarks at any of the four stormwater outfalls. Results for TKN, Total Nitrogen and *E. coli* are above the benchmarks. Total Suspended Solids results are only above the benchmark value at Outfall 002. Nitrate-Nitrites results are above the benchmark only at outfall 005 but not by a large amount.

Effluent Monitoring

As an IndSWGP Sector T, Treatment Works discharge there are no 'sector specific' stormwater discharge monitoring requirements. However, stormwater monitoring is required for parameters with screening results above the benchmark concentrations: TKN, Total Nitrogen and *E. coli.* In addition, TSS is included as a best professional judgement (BPJ) parameter as an indicator of the effectiveness of stormwater pollution prevention measures. Total phosphorus (TP) is monitored as a BPJ parameter for assessing nutrient loadings associated with stormwater from the facility. All outfalls are monitored for the same parameters. Semi-annual monitoring is required in accordance with the 2014 IndSWGP.

The receiving streams, Dan River, Pumpkin Creek and the unnamed tributary to the Dan River, are impaired for bacteria (*E. coli*) and future TMDLs scheduled for PCBs and mercury. In accordance with GM09-2008 and the 2014 IndSW GP 'Discharges to Impaired Waters' are subject to semi-annual monitoring to verify that the SWPPP is adequately controlling for the impairing parameters. *E. coli* monitoring and the TMDL stormwater special condition have been included. The permit renewal serves as notification that the discharge is subject to the TMDL requirements. A provision allows the TMDL *E. coli* monitoring to be discontinued after the first four monitoring periods (subject to DEQ approval) if the pollutant subject to the TMDL is not detected in any of the samples.

Pumpkin Creek is listed for benthic impairment. The TMDL has not been prepared. The semi-annual TSS monitoring on outfall 005 will verify that stormwater from this outfall is not contributing to the impairment.

The Dan River is also impaired for PCBs and mercury. Neither of these TMDLs have been completed and no monitoring for either PCB or mercury is included in the reissuance but monitoring may be added during the term of the Permit based on the TMDL Reopener special condition if required by each TMDL when prepared. Facilities will be given written notification from DEQ that they are subject to the impaired water monitoring. Facilities must monitor once during the monitoring period (essentially annually) for all the pollutants that are causing the impairment. Facilities may be waived from further monitoring if the pollutant is not present in their discharge, or the presence is due solely to natural background conditions.

17. **Basis for Sludge Use and Disposal Requirements**:
Requirements are based on VPDES Permit Regulations Part VI beginning with 9 VAC 25-31-420 through 720, and 8 VAC 25-32-303 et. seq. and the December 2013 draft Land Application of Biosolids guidance/template for the biosolids generator when land applied by a contractor. The generator (permittee) contracts for land application of sludge and that contractor assumes responsibility for the proper use of the sludge. Currently the sludge is land applied under contract in North Carolina, and monitoring of soils are not required of the permittee. If in the future the sludge application is in Virginia the contractor will need a biosolids (construction and/or operation) permit where the sludge is land applied, typically a VPA Permit. The generator is still responsible for complying with the recordkeeping, concerning chemical pollutants, pathogen reduction, and Vector Attraction Reduction (VAR); and other requirements associated with record keeping for the biosolids to be land applied.

Sewage sludge is collected from the secondary clarifiers, pumped to the Southside plant and treated using various methods described in the VPDES Sewage Sludge Permit Application Form and Sludge Management Plan (SMP). The annual average of sludge generated is 1102 dry metric tons. On site, sludge is stored in two 7.5 MG basins at the Southside WWTP. Sludge operations are handled as part of the treatment plant operations contract with Severn Trent Environmental Services, Inc. (STES). STES currently subcontracts with Synagro to land apply the biosolids to farm fields in North Carolina. Because the land application is in North Carolina there is no land application site information included in the permit application. The subcontractor is responsible for compliance with land application requirements with applicable regulations in North Carolina. Sludge sampling is performed to confirm compliance including adequate pathogen and VAR. Nuisance odor monitoring is a continuous concern for the sludge operations due to a 'downwind' golf course. Danville's Northside WWTP is on DEQ's 2013 listing of facilities with approved sludge treatment for land application. To be included on this list the facility had to perform PCB monitoring that was below detection.

The application indicates that the facility meets the criteria of a Class I sludge management facility. The Instructions for the Sludge Application define a **Class I** sludge management facility as either:

- Any POTW required to have an approved pretreatment program under Part VII of the VPDES Permit Regulation, 9 VAC 25-31-730 to 900; or
- Any treatment works treating domestic sewage classified as a Class I sludge management facility by the EPA Regional Administrator in conjunction with the DEQ because of the potential for its sewage sludge use or disposal practices to adversely affect public health and the environment.

Northside WWTP fits the first criteria.

Currently **Class B** pathogen reduction *Alternative 1* is used – Monitoring of Indicator Organisms. Pathogen reduction is accomplished through extended detention in the anaerobic treatment basins at the Southside treatment works. VAR *Option 1* is achieved by producing a '38% reduction in volatile solids' by extended anaerobic storage in the sludge basins. The basins are aerated for mixing of the digested sludge during removal.

The application includes an additional option for meeting **Class B** pathogen reduction criteria. Alternative 2, *Option 5*, Processes to Significantly Reduce Pathogens (PSRP) which is 'lime stabilization'. When this method of meeting Class B standard is used, it is followed by VAR *Option 6*, alkali stabilization. Lime is added as a solid or slurry. The lime/alkali stabilization requires pH be raised to 12 s.u. for 2 hours and retained at $\geq$ 11.5 s.u. for an additional 22 hours.

The sludge is subject to CPLRs (Cumulative Pollutant Loading Rates). The frequency of sludge quality and quantity monitoring is based on the historic quantity generated at the facility. The application indicates 1102 dry tons generated annually. This quantity corresponds with a recommended monitoring frequency of once/quarter (4/year). The 2007 reissuance specified at once/2 months. However, the facility appears to remove sludge from the sludge management operations at the Southside area of the plant for land application for only 2 to 5 months per year. After consulting with the permittee monitoring of processed biosolids is set at twice per quarter for quarters when sludge is being processed for land application by the contractor. In quarters when no sludge is processed monitoring reports are to be submitted indicating no biosolids processed for disposal activity.

BASES FOR LIMITATIONS AND MONITORING REQUIREMENTS

Monitoring Type: Biosolids Monitoring

Monitoring Location: Final Biosolids product after all treatment, prior to land application

PARAMETER	LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Average**	Maximum (Ceiling Concentration)**	Frequency	Sample Type
Percent Solids (%)	NL*	NA	2/quarter	Composite
Volatile Solids (%)*	NL*	NA	2/quarter	Composite
Total Arsenic (mg/kg)*	41*	75	2/quarter	Composite
Total Cadmium (mg/kg)*	39*	85	2/quarter	Composite
Total Copper (mg/kg)*	1,500*	4,300	2/quarter	Composite
Total Lead (mg/kg)*	300*	840	2/quarter	Composite
Total Mercury (mg/kg)*	17*	57	2/quarter	Composite
Total Molybdenum (mg/kg)*	NL*	75	2/quarter	Composite
Total Nickel (mg/kg)*	420*	420	2/quarter	Composite
Total Selenium (mg/kg)*	100*	100	2/quarter	Composite
Total Zinc (mg/kg)*	2,800*	7,500	2/quarter	Composite
Total Kjeldahl Nitrogen (mg/kg)	NL	NA	2/quarter	Composite
Ammonia Nitrogen (mg/kg)	NL	NA	2/quarter	Composite
Nitrate Nitrogen (mg/kg)	NL	NA	2/quarter	Composite
Total Phosphorus (mg/kg)	NL	NA	2/quarter	Composite
Total Potassium (mg/kg)	NL	NA	2/quarter	Composite
pH (standard units at 25 ^{o}C)	NL	NA	2/quarter	Composite
Alkalinity as $CaCO_3$ (%) ***	NL	NA	2/quarter	Composite
CCE as $CaCO_3$ (%) (If lime by weight is 10% or	NL	NA	2/quarter	Composite

NL = No Limitation, monitoring required
NA = not applicable
2/quarter = twice per quarter that biosolids are processed for land applied
Lbs/DT = pounds per dry ton

* = Constituents subject to cumulative pollutant loading rates (CPLR), pollutant concentrations (PC) and ceiling limits. (PC biosolids contain the constituents indentified above with * at concentrations below the monthly average specified. If the concentration of any of these constituents in biosolids from any source exceeds the monthly average concentration, then the biosolids from the source are subject to CPLR rules and tracking

** = Values are to be on a 'dry weight basis' unless otherwise indicated

*** = Lime treated sludge (10% or more $CaCO_3$ by dry weight) should be analyzed for percent Calcium Carbonate Equivalence (CCE)

The permit sludge monitoring pages of Part III.A also contain operational requirements for alternatives for both pathogen reduction and vector attraction based on the VPDES Sewage Sludge Permit Application Form/Sludge Management Plan. Pathogen reduction and vector attraction reduction alternatives remain the same as the 2007 reissuance but the frequency of monitoring is set at twice per quarter to provide representation of the quality of biosolids. Special conditions pertaining to biosolids included in Part III of the permit are discussed in section 19 of this Fact Sheet in the order that they appear.

18. **Antibacksliding Analysis**: Outfall 001 limitations have been reevaluated based on the change in design capacity of the treatment plant from 24 mgd to 20 mgd. Increases in limits associated with the lower design flow do not constitute backsliding because the plant has undergone treatment plant design flow reduction. Where seasonal load limits are based on a Water Quality Management Plan the loads are maintained and concentrations increased – BOD & TKN.

19. **Compliance Schedules:** No compliance schedules are included in this permit. Limits and requirements are effective upon reissuance of the permit.

20. **Special Conditions**: A brief rationale for each special condition contained in the permit is given below.

Additional Chlorine Limitations and Monitoring Requirements (Part I.B.1.) - Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.

95% Capacity Reopener (Part I.C.1.) - Rationale: Required by VPDES Permit Regulations 9 VAC 25-31-200.B.4 for all POTW and PVOTW permits.

Indirect Dischargers (Part I.C.2.) - Rationale: Required by VPDES Permit Regulations 9 VAC 25-31-200.B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

CTC, CTO Requirement (Part I.C.3.) - Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790.

O&M Manual Requirement (Part I.C.4.) - Rationale: Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulations 9 VAC 25-31-190.E.

Licensed Operator Requirement (Part I.C.5.) - Rationale: The VPDES Permit Regulations 9 VAC 25-31-200.C and the Code of Virginia §54.1-2300 et seq., Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18 VAC 160-20-10 et seq.), require licensure of operators.

Reliability Class (Part I.C.6.) - Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal facilities.

Material Handling and Storage (Part I.C.7.) – Rationale: 9VAC25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

Water Quality Criteria Reopener (Part I.C.8.) - Rationale: VPDES Permit Regulation, 9VAC25-31-220 D requires effluent limitations to be established which will contribute to the attainment or maintenance of water quality criteria.

Total Maximum Daily Load Reopener (Part I.C.9.) - Rationale: Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

Minimum Freeboard (Part I.C.10.) – Rationale: Minimize the discharge of untreated wastewater to surface waters or the groundwater. Condition brought forward from previous Permit.

Compliance Reporting (Part I.C.11.) - Rationale: Authorized by VPDES Permit Regulation, 9VAC25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

Water Quality Criteria Monitoring (Part I.C.12.) - Rationale: State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility's effluent for the substances noted in *Attachment A* of this VPDES permit.

Facility Closure Plan (Part I.C.13.) – Rationale: This condition establishes the requirement to submit a closure plan for the treatment works if the treatment facility (or portion of) is being replaced or is expected to close. This is necessary to ensure treatment works are properly closed so that the risk of untreated waste water discharge, spills, leaks and exposure to raw materials is eliminated and water quality maintained. Section 62.1-44.21 requires every owner to furnish when requested plans, specification, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purpose of the State Water Control Law.

Whole Effluent Toxicity Program (Part I.D) - Rationale: VPDES Permit Regulation, 9 VAC 25-31-210 and 220 I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act.

Pretreatment (Part I.E.) - Rationale: VPDES Permit Regulation 9 VAC 25-31-730 through 900, and 40 CFR Part 403 require certain existing and new sources of pollution to meet specified regulations. The special condition is for localities with existing pretreatment programs and requires annual reporting and maintenance of the program in accordance with the Regulations.

Storm Water Management (Part I.F) - Rationale: VPDES Permit Regulation, 9 VAC 25-31-10 defines discharges of storm water from municipal treatment plants with design flow of 1.0 mgd or more, or plants with approved pretreatment programs, as discharges of storm water associated with industrial activity. 9 VAC 25-31-120 requires a permit for these discharges. The Pollution Prevention Plan requirements are derived from the VPDES general permit for discharges of storm water associated with industrial activity, 9 VAC 25-151-10 et seq.

Conditions Applicable to All VPDES Permits (Part II) - Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

Conditions Applicable to Biosolids Management (Part III)

Limitations and Monitoring Requirements (Part III.A) – Rationale: VPDES Permit Regulations Part VI beginning with 9 VAC 25-31-420 through 720, and 8 VAC 25-32-303 et. seq.; Title 40 of the Code of Federal Regulations, Parts 503 and 136 as Class B biosolids.

Quarterly Reporting (Part III.B.1) – Rationale: Required by the VPDES Permit Regulation Part VI, 9 VAC 25-31-420 through 720, for generators who land apply sewage sludge generated during the treatment of domestic sewage in a treatment works. Specific information to be provided and maintenance requirements are identified in 9 VAC 25-20-147 A. In accordance with 9 VAC 25-31-530 F, the permittee shall develop the notice and necessary information (NANI) and submit a copy to the DEQ.

Annual Report (Part III.B.2) – Rationale: 9 VAC 25-31-590 of the VPDES Permit Regulation and 9 VAC 25-32-440.D of the VPA Permit Regulation require the submittal of certain permit requirements for the previous calendar year's activities on February 10 of each year.

Notice and Necessary Information (NANI) **(Part III.B.3)** – Rationale: 9VAC 25-31-530.F requires the generator of biosolids who provides biosolids to a land applier, to give notice and necessary information to the land applier. 9 VAC 25-31-480 states that the preparer of biosolids shall ensure that the applicable requirements in 9 VAC 25-31 Part VI are met when biosolids are land applied.

Class B/PC Biosolids Record Keeping (Part III.B.4) – Rationale: Required by the VPDES Permit Regulation Part VI, 9 VAC 25-31-420 through 720, for generators who land apply sewage sludge generated during the treatment of domestic sewage in a treatment works.

Records Retention (Part III.B.5) – Rationale: 9 VAC 25-31-580.A.5.b of the VPDES Permit Regulation and 9 VAC 32-80.H.2 of the VPA Permit Regulation require that specified biosolids documentation be maintained for at least 5 years.

Biosolids Management Plan (BSMP) (Part III.B.6) – Rational: VPDES Permit Regulation, 9 VAC 25-31-485 B requires the permit holder to maintain and implement a Biosolids Management Plan (BSMP) consisting of permit application with associated sludge management plan and states that the BSMP is an enforceable part of the permit. Also, 9 VAC 25-31-100 Q.2 requires an Odor Control Plan. The VPDES

Permit Regulation, 9 VAC 25-31-100 Q; 220 B.2; and 420 and 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal

Offsite Spill Reporting (Part III.B.7) – Rational: In accordance with 9 VAC 25-32-540 of the VPA Permit Regulation requires prompt notification of offsite spills.

Sludge Reopener (Part III.B.8) - Rationale: Required by VPDES Permit Regulation, 9VAC25-31-220 C for all permits issued to treatment works treating domestic sewage.

21. **Changes to the Permit:**

Changes to Effluent Limitations and Monitoring for **Outfall 001** from the 2007 permit, during permit processing or during public notice:

Outfall 001 limitation pages have been reduced/eliminated with the 'unclogging' of diffuser ports in the Dan River and renovation of the treatment plant to 20 mgd design capacity.

Parameter Changed	Effluent Limits Changed (monthly avg./weekly avg.)		Monitoring Requirement Changed		Reason for Change	Date
	From	To	From	To		
Dissolved Oxygen (DO)	No limit	none	1/day	none	Primary industrial source of DO sag has ceased discharge.	Jan 2014
BOD_5 (Nov-May)	2725/4088 kg/day	2200/3400 kg/day	1/day	5 days/wk	Change design flow rate; decrease frequency: Permit Manual MN-2 A.4	Jan 2014
BOD_5 (Jun-Oct)	21/31.5 mg/L 2861 kg/day	25/37 mg/L 2800 kg/day	1/day	5 days/wk	Conc. increase: decreased flow rate; reduce significant digits to 2; decrease frequency: Permit Manual MN-2 A.4	Jan 2014
TSS	2725/4088 kg/day	2200/3400 kg/day	1/day	1/week	Change design flow rate; reduce significant digits to 2; decrease frequency: Permit Manual MN-2 A.4	Jan 2014
TRC	54/65 µg/L	1.4/1.5 mg/L	1/day	1/ 2-hours	Decreased flowrate reevaluate toxic limit; increase frequency Permit Manual MN-2 A.4	Jan 2014
E. coli	None	126 N/100ml	None	4/month (weekly)	TMDL bacterial allocation monitoring, monitoring frequency Permit Manual MN-2 A.4	Jan 2014
TKN (Jun-Oct)	20/30 mg/L 2725/4088 kg/day	24/36 mg/L 1817/2700 kg/day	1/day	2 days/wk	Change design flow rate; decrease frequency, Permit Manual MN-2 A.4	Jan 2014
Ammonia (June-Dec)	None	13 mg/L	None	1/month	Seasonal monitoring verify ammonia toxicity controlled in low flow months; Permit Manual MN-2 A.4	Jan 2014
Silver & Zinc, dissolved	None	NL	None	1/3 months	metals data indicates dissolved data needed to assess toxicity	Jan 2014

Outfalls 002 – 005 Stormwater

Parameter Changed	Effluent Limits Changed (monthly avg./weekly avg.)		Monitoring Requirement Changed		Reason for Change	Date
	From	To	From	To		
pH, TSS, Phosphorus & Nitrogen	None	NL	None	1/6 months	GM 09-2008 as Sector T stormwater associated with industrial activity treatment works	May 2013
E. coli	None	235 N/100 ml	None	1/6 months	TMDL impairment monitoring GM09-2008	May 2013

Sludge/Biosolids Generation

Parameter Changed	Effluent Limits Changed (monthly avg./weekly avg.)		Monitoring Requirement Changed		Reason for Change	Date
	From	To	From	To		
All biosolids/ sludge monitored parameters	No change	No change	1/2 months	2/quarter biosolids processed	Best professional judgement to better quantify compliance for few months materials generated.	Dec. 2013 May 2014

Deletions or Modifications to special conditions from the 2007 permit: The wording and order of special conditions has been updated in accordance with the latest edition of the VPDES Permit Manual and related procedural guidance. See part 20 of this Fact Sheet for rationale for including and explanation for any modification from the wording in the VPDES Permit Manual. (Numbers referenced from 2007 Permit)

B.1. Additional TRC Limitations & Monitoring: Wording requires monitoring for chlorine levels at end of each contact tank to verify adequate disinfection in each contact tank prior to comingling of each tank's flow and dechlorination.

C.5. O&M Manual: along with other changes to condition the submittal of an updated O&M Manual for review is no longer required but DEQ may request and must be submitted within 30 days.

C.7. Expanded Flow Notification: removed as permit now reflects only 20 mgd discharge rate.

C.8. Form 2F Sampling: removed as 2F stormwater data submitted with application for this reissuance.

C.9. Compliance Reporting: Added more parameters to list of quantification levels.

C.13. Instream Dissolved Oxygen Monitoring: Condition no longer needed as industrial contributor that was significant contributor to DO demand from effluent is no longer in existence. In addition, other industrial contributors and overall influent flows are greatly reduced.

C.14. Permit Application Requirement: Removed as condition is redundant with Part II.M.

E. Toxic Management Program: Revised to semi-annual and only require chronic tests with reporting of LC_{50} at 48 hours and the IC_{25} to show acute toxicity.

F. Sludge/Biosolids requirements have moved to Part III of the Permit. Revised based on changes to Regulations and guidance on land application of biosolids.

G. Storm Water Management Conditions: updated in accordance with IndSWGP, VPDES Permit Manual and GM 09-008

No other conditions included in the 2007 reissuance have been removed.

Additions to the special conditions from the 2007 permit: (reference numbering from this reissuance)

C.7 Material Handling and Storage: condition added in accordance with VPDES Permit Manual.

C.13 Water Quality Criteria Monitoring: condition added for design flow of facility & change in wastewater treatment processes. Monitoring is to be performed 3 times during term in 2017.

22. **Variances/Alternate Limits or Conditions:**

Condition Part I.B regarding TRC, is modified from the wording of the VPDES Permit Manual to reflect sampling in each chlorine contact tank to confirm adequate disinfection in each tank.

The monitoring frequency for TKN is less than the VPDES Permit Manual recommends. See discussion is section 16 under Effluent Limitations for BOD_5 and TKN.

The monitoring frequency for TSS is more frequent than the VPDES Permit Manual recommends. See discussion is section 16 under Effluent Limitations for TSS.

WET testing 4 semi-annual tests rather that 1/year over term to provide results early in term to assess if toxicity present and allow time for additional bioassays for renewal if better characterize variability.

No other variances/alternate limits or conditions were applied in drafting of the Permit.

23. **Regulation of Users, 9 VAC25-31-280 B 9:**

This section is intended for treatment works that are not owned by a state or municipality to include a statement about how industrial indirect dischargers (users) are or will be regulated. Since this facility is owned by a municipality, this section is not applicable. Pretreatment and 'Indirect Dischargers' special conditions are included in the Permit to evaluate the impact of industrial contributors to the treatment works and collection system.

24. **Public Notice Information required by 9 VAC 25-31-280 B:**

All pertinent information is on file and may be inspected, and copied by contacting Susan Edwards at: Virginia DEQ-BRRO Roanoke, 3019 Peters Creek Rd., Roanoke, VA 24019; 540-562-6764 or by e-mail at Susan.Edwards@deq.virginia.gov.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may review the draft permit and application at the DEQ Blue Ridge Regional Office by appointment.

25. **Additional Comments:**

Previous Board Action**:** The City of Danville and DEQ entered into a Letter of Agreement (LOA) dated Nov. 2, 2012 in which significant improvements/renovations to the treatment plant have been undertaken. The City has diligently pursued the construction of numerous projects to upgrade the treatment works. AECOM designed upgrades throughout the plant. Substantial funds have been allocated to implement plant upgrades/renovations without any grant funds. Numerous Certificates-to-Construct have been followed by Certificates-to-Operate as projects are systematically undertaken and completed. The last paragraph on Page 6 of the LOA states that it 'terminates automatically 12 months after the date you, (Mr. Dunkley) sign original letter' which was Nov. 9, 2012. Thus the LOA expired on Nov. 9, 2013. The Nov.14, 2013 Progress Report affirms this understanding. The City plans to pursue additional treatment works upgrades as funding permits. A copy of the LOA in included in **Attachment C**.

Staff Comments: The discharge is not controversial. The BRRO-L Water Permit Support Group notes that bacterial TMDL did not include an allocation for the discharge and the approved TMDL must be amended to reflect the proper allocation for the discharge. Otherwise, the discharge is in conformance with the existing planning document for the area.

Public Notice Comments: No comments were received during the public notice.

Other Agency Comments:

The VDH Danville Office of Drinking Water replied to the review of application package by memorandum dated January 23, 2012. A copy of the response is included in **Attachment C**.

Danville's Northside WWTP is not on the DCR, DGIF and USFWS list of Permits requiring Threatened and Endangered Species coordination and review.

26. **303(d) Listed Segments (TMDL)**

Danville's Northside WWTP outfall 001 and stormwater outfall 002 discharge to the Dan River watershed (VAC-L60R-01) of the Roanoke River basin. The 2012 List of Category 5 Impaired Waters (303(d) list), approved by EPA on 12/12/13, includes 61.66 miles of the waterbody for mercury (L60R-01-HG) and PCB (L60R-01-PCB) in fish tissue. The impairments cause the segment to fail to support the fish consumption use. The sources of impairment are currently unknown for both pollutants. PCB monitoring using extremely low detection levels for TMDL development has been completed and submitted. Mercury monitoring is not required in the permit but a TMDL reopener special condition is included to allow monitoring. TMDLs are scheduled for 2014 for PCB and 2020 for Mercury. The 2012 Impaired Waters Fact Sheets are provided in **Attachment A**.

The Dan River is also impaired for bacteria. A TMDL has been prepared and approved for 36.79 miles of the Dan River. The bacterial TMDL was approved by EPA in December 8, 2008 and by the State Water Control Board (SWCB) in April 28, 2009. The TMDL has twice been modified and approved by the EPA. The TMDL did not include an *E. coli* bacterial allocation for the discharge from Northside WWTP (outfall 001). *E. coli* monitoring for outfall 001 is included in the permit. Outfall 002 stormwater monitoring will demonstrate that the SWPPP is effectively controlling bacteria levels in stormwater. See **Attachment A** for an excerpt from the TMDL with the listing of the point sources within the impaired watersheds and allocation table showing the Northside WWTP was not given an allocation in the Dan River segment WLA table. **Attachment A** also includes a page from the 2012 Impaired Waters (Category 4A) TMDL Approved, approved by EPA on 12/12/13, 34.63 miles of the waterbody are listing the bacterial impairment. The permit is being issued in compliance with water quality standards for bacteria.

Northside WWTP's stormwater outfalls 003 and 004 discharge to an Unnamed Tributary to the Dan River watershed (L60R) of the Roanoke River basin. The 2012 Impaired Waters lists do not specifically identify the unnamed tributaries for bacterial impairment. The permit includes semi-annual *E. coli* monitoring of stormwater to demonstrate that the SWPPP is effectively controlling bacteria levels in stormwater.

Northside WWTP's stormwater outfall 005 discharges to Pumpkin Creek, watershed of the Roanoke River basin. On the 2012 List of Category 5 Impaired Waters (303(d) list), approved by EPA on 12/12/13, 3.94 miles of the waterbody is listed for benthic impairment. The impairment causes the segment to fail to support the aquatic life use (L60R-02-BEN). The cause of impairment is believed to be urban watershed related. The TMDL is scheduled for 2024. On the 2012 Impaired Waters (Category 4A) TMDL, approved by EPA on 12/12/13, 3.94 miles of the waterbody are listed for bacterial impairment. The impairment causes the segment to fail to support the recreation use. The TMDL for this tributary to the Dan River is scheduled to be completed by 2018. The permit includes semi-annual TSS and *E. coli* monitoring of stormwater to demonstrate that the SWPPP is effectively controlling bacteria and sediment levels. The 2012 Impaired Waters Fact Sheet and page from the 2012 Category 4A list are provided in **Attachment A**.

VPDES Permit VA0060593
Danville – Northside WWTP
Reissuance 2014

ATTACHMENT A

- April 6, 2012 Flow Frequency Memo
- Wastewater Treatment Plant site layout and Flow Diagram with picture inserts from application package
- Portion of USGS Ringgold quadrangle Topographic Map showing outfalls – multiple pages with outfalls labeled
- Aerial view of plant layout with labeling of major plant components & expanded aerial view of plant with labeling of property, outfall 001 with Northside/Southside plant areas.
- August 17, 2012 Site Visit Memo for July 3, 2012 visit
- Portion of 2012 Impaired Waters (Category 5) 303(d) List – Waters needing TMDL showing L60R-01-HG and L60R-01-PCB for the Dan River, Banister River and Hyco River
- 2012 Impaired Waters Fact Sheet L60R-01-HG & L60R-01-PCB for the Dan River, Banister River and Hyco River
- Portion of 2012 Impaired Waters Category 4A TMDL Approved list showing L60-01-BAC for the Dan River and L60R-02-BAC for Pumpkin Creek
- Excerpt from Dan River Bacterial TMDL
- 2012 Impaired Waters Fact Sheet L60R-01-BAC for Pumpkin Creek
- Water Quality Management Plan – 9 VAC 25-72-80 Roanoke River Basin, B. Non-TMDL Waste Load Allocations, VAW-L60R for the VPDES Permit VA0060593
- VEGIS vicinity map showing outfall & STORET monitoring Station 4ADAN053.40
- Temperature, pH, DO and hardness data from STORET Station 4ADAN053.40

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
South Central Regional Office - Water Planning
7705 Timberlake Road Lynchburg, VA 24502 434/582-5120

SUBJECT: Flow Frequency Determination
Danville City – Northside WWTP #VA0060593

TO: Kirk Batsel

FROM: Amanda Gray

DATE: April 6, 2012

COPIES: File

The Danville City – Northside WWTP discharges via 6 outfalls to the Dan River, Pumpkin Creek or an Unnamed Tributary to the Dan River near Danville, VA. Stream flow frequencies are required at this site by the permit writer for the purpose of calculating effluent limitations for the VPDES permit.

The USGS has operated a continuous record gage on the Dan River at Danville, VA (#02075000) from 1934 to 1995. The gage is located approximately 2.5 miles upstream of the discharge point. The Danville Industrial WTP intake is located between the gage and the outfall. The flow frequencies for the gage and discharge point were determined by drainage area proportions and do not address any withdrawals, discharges, or springs lying upstream. The maximum daily withdrawal from the WTP for both the high flow and low flow periods, observed over the last 10 years, has been subtracted.

Dan River in Danville, VA (#02075000):

Drainage Area: 2050 mi^2

1Q10 = 268 cfs	High Flow 1Q10 = 607 cfs
7Q10 = 442 cfs	High Flow 7Q10 = 857 cfs
30Q5 = 644 cfs	High Flow 30Q10 = 1029 cfs
30Q10 = 567 cfs	Harmonic Mean = 1375 cfs

Dan River at Outfall 001, 002:

Drainage Area: 2098.41 mi^2

1Q10 = 274cfs – 6.25cfs = 267.75cfs (173MGD)
7Q10 = 452cfs – 6.25cfs = 445.75cfs (288MGD)
30Q5 = 659cfs – 6.25cfs = 652.75cfs (422MGD)
30Q10 = 580cfs – 6.25cfs = 573.75cfs (371MGD)
High Flow 1Q10 = 621cfs – 12.2cfs = 608.8cfs (393MGD)
High Flow 7Q10 = 877cfs – 12.2cfs = 864.8cfs (559MGD)
High Flow 30Q10 = 1053cfs – 12.2cfs = 1040.8cfs (672 MGD)
Harmonic Mean = 1407cfs – 6.25cfs = 1400.75cfs (905MGD)

The USGS conducted several flow measurements on Fall Creek from 1981 to 1984. The measurements were made at the Route 719 bridge near Danville, VA. The measurements made correlated very well with the same day daily mean values from a continuous record gage located on Sandy River near Danville, VA (#02074500). The measurements and daily mean values were plotted on a logarithmic graph and a best-fit line was drawn through the data points. The required flow frequencies from the reference gages were used in a regression analysis to determine the flow frequencies at the measurement site. The flow frequencies at the discharge point were determined by using values at the measurement site and adjusting them by proportional drainage areas. The data for the reference gage, the measurement site and the discharge point are presented below.

Sandy River near Danville, Va. #020745000:

Drainage Area: 112 mi^2

1Q10 = 13 cfs	High Flow 1Q10 = 34 cfs
7Q10 = 15 cfs	High Flow 7Q10 = 39 cfs
30Q5 = 24 cfs	High Flow 30Q10 = 50 cfs
30Q10 = 20 cfs	Harmonic Mean = 61 cfs

Fall Creek at Rte 719 bridge, near Danville, Va. #02075020:

Drainage Area: 5.39 mi^2

1Q10 = 0.091 cfs	High Flow 1Q10 = 0.516 cfs
7Q10 = 0.118 cfs	High Flow 7Q10 = 0.661 cfs
30Q5 = 0.276 cfs	High Flow 30Q10 = 1.034 cfs
30Q10 = 0.199 cfs	Harmonic Mean = 1.48 cfs

Pumpkin Creek at 005:

Drainage Area: 5.49 mi^2
1Q10 = 0.093 cfs (0.06 MGD)
7Q10 = 0.12 cfs (0.08 MGD)
30Q5 = 0.28 cfs (0.18 MGD)
30Q10 = 0.2 cfs 0.13 MGD)
High Flow 1Q10 = 0.53 cfs (0.34 MGD)
High Flow 7Q10 = 0.67 cfs (0.43 MGD)
High Flow 30Q10 = 1.05 cfs (0.68 MGD)
Harmonic Mean = 1.5 cfs (0.97 MGD)

UT, Dan River at 003, 004, 006:

Drainage Area: 0.25 mi^2
1Q10 = 0.004 cfs (0.002 MGD)
7Q10 = 0.005 cfs (0.003 MGD)
30Q5 = 0.013 cfs 0.008 MGD)
30Q10 = 0.009 cfs (0.006 MGD)
High Flow 1Q10 = 0.024 cfs (0.015 MGD)
High Flow 7Q10 = 0.031 cfs (0.02 MGD)
High Flow 30Q10 = 0.048 cfs (0.031 MGD)
Harmonic Mean = 0.069 cfs (0.044 MGD)

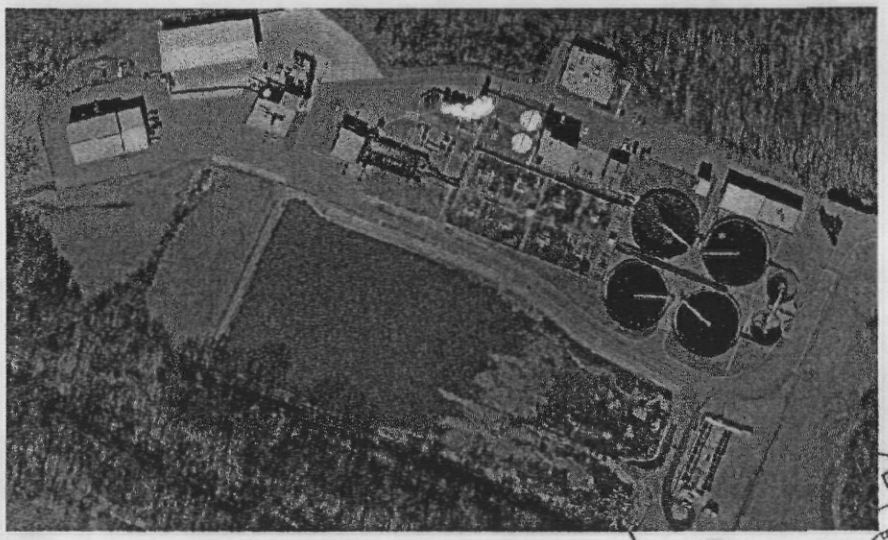
The high flow months are January to May. This analysis assumes there are no significant discharges, withdrawals or springs influencing the flow.

If there are any questions concerning this analysis, please let me know.

Figure 2

CITY OF DANVILLE

NORTHSIDE WASTEWATER TREATMENT PLANT



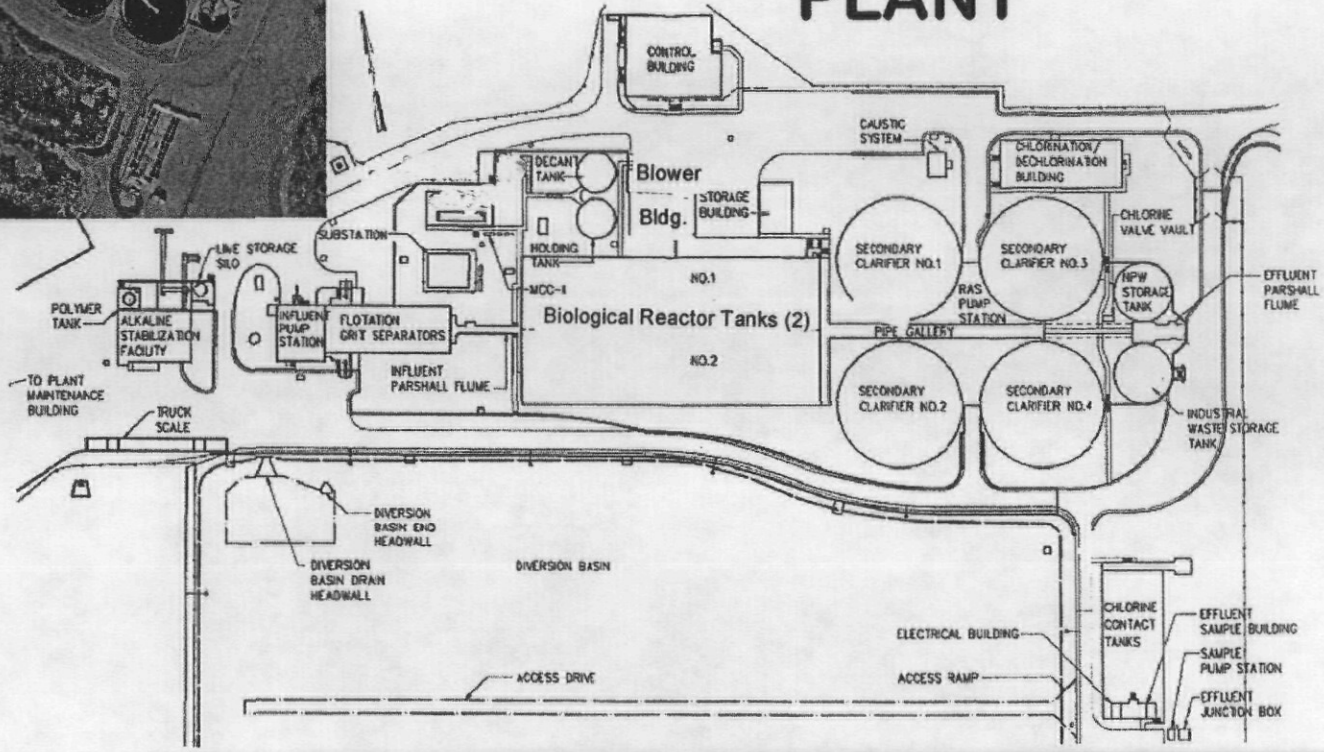


Figure 2

DANVILLE NSWWTP

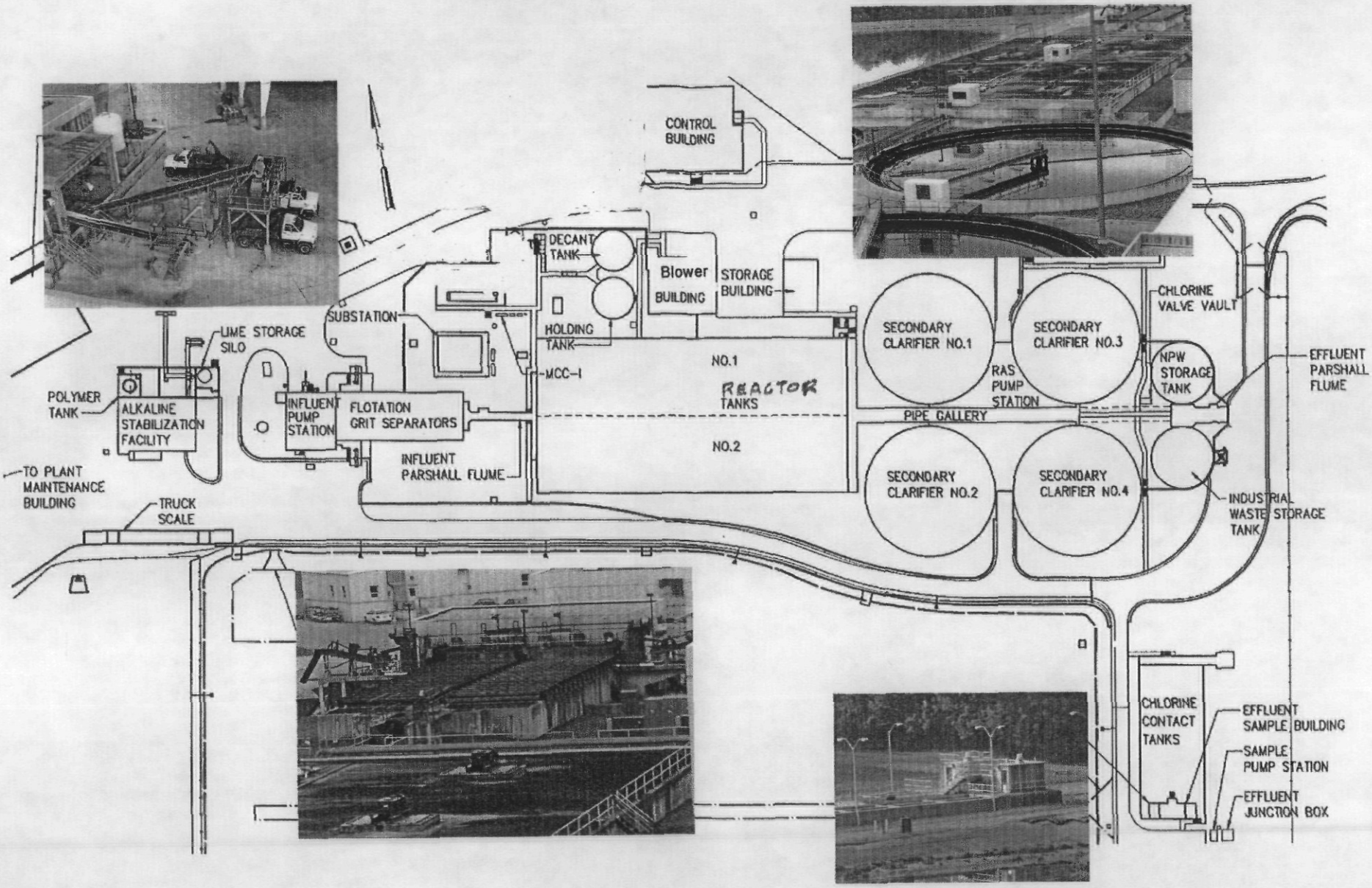
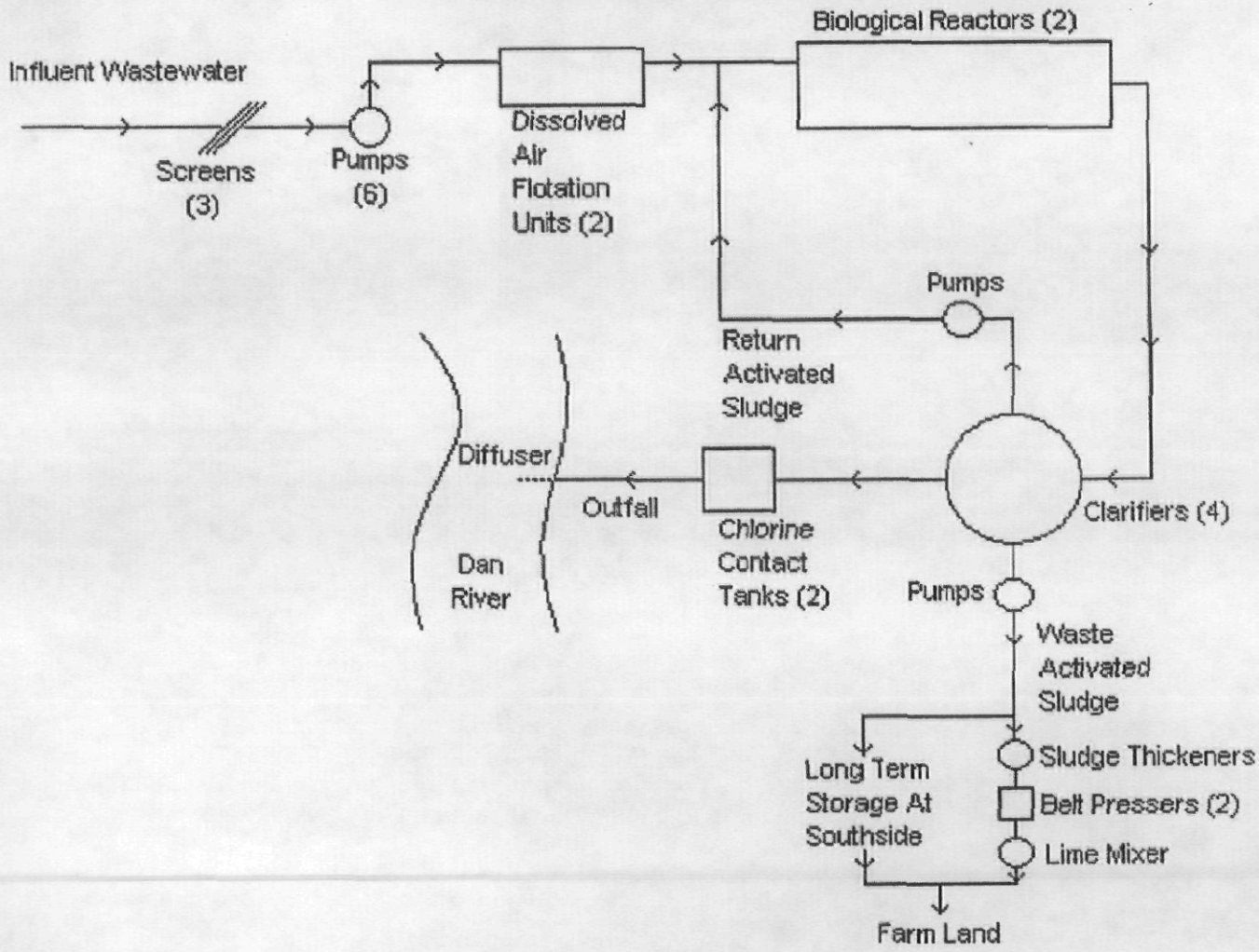
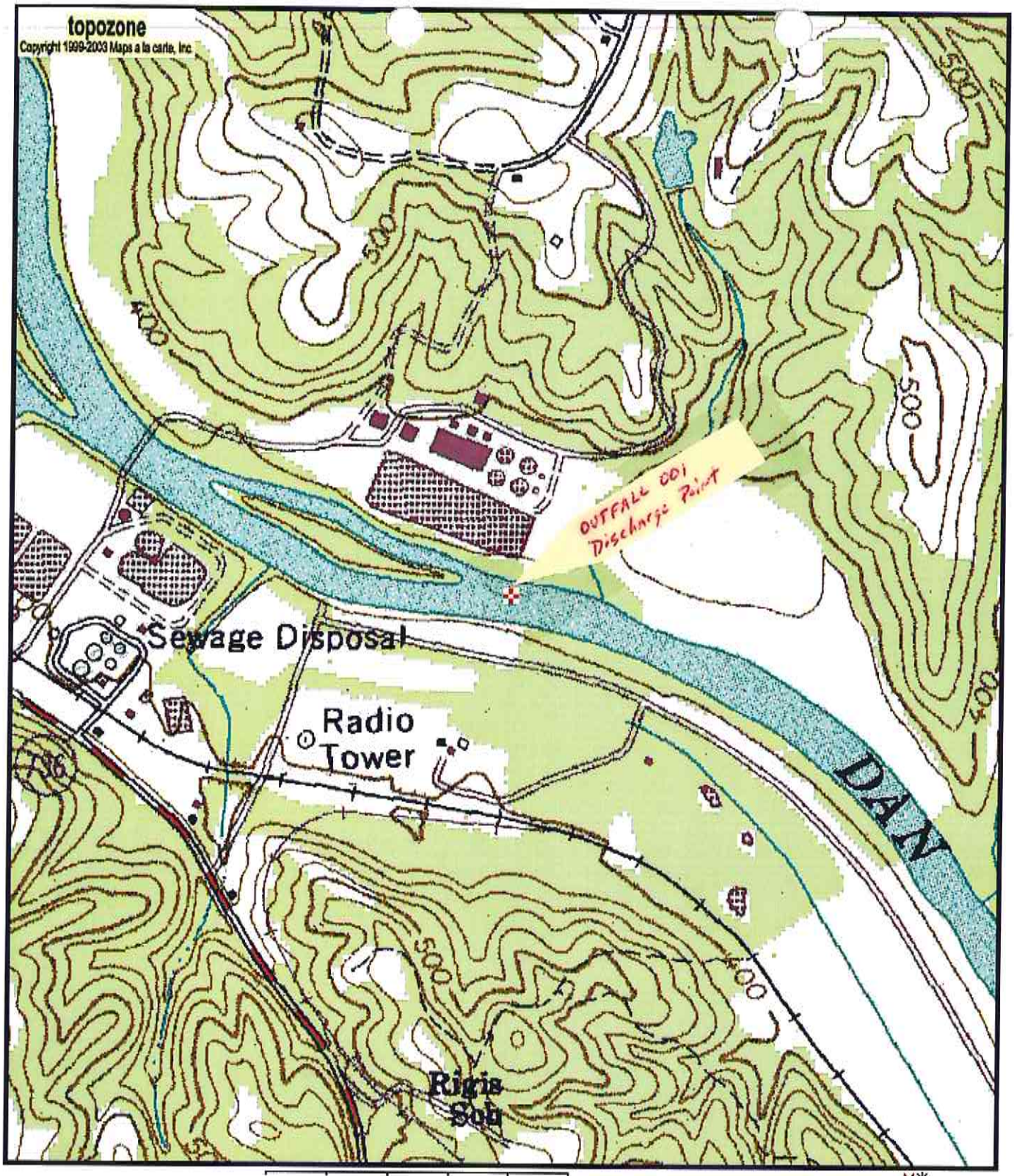


Figure 4

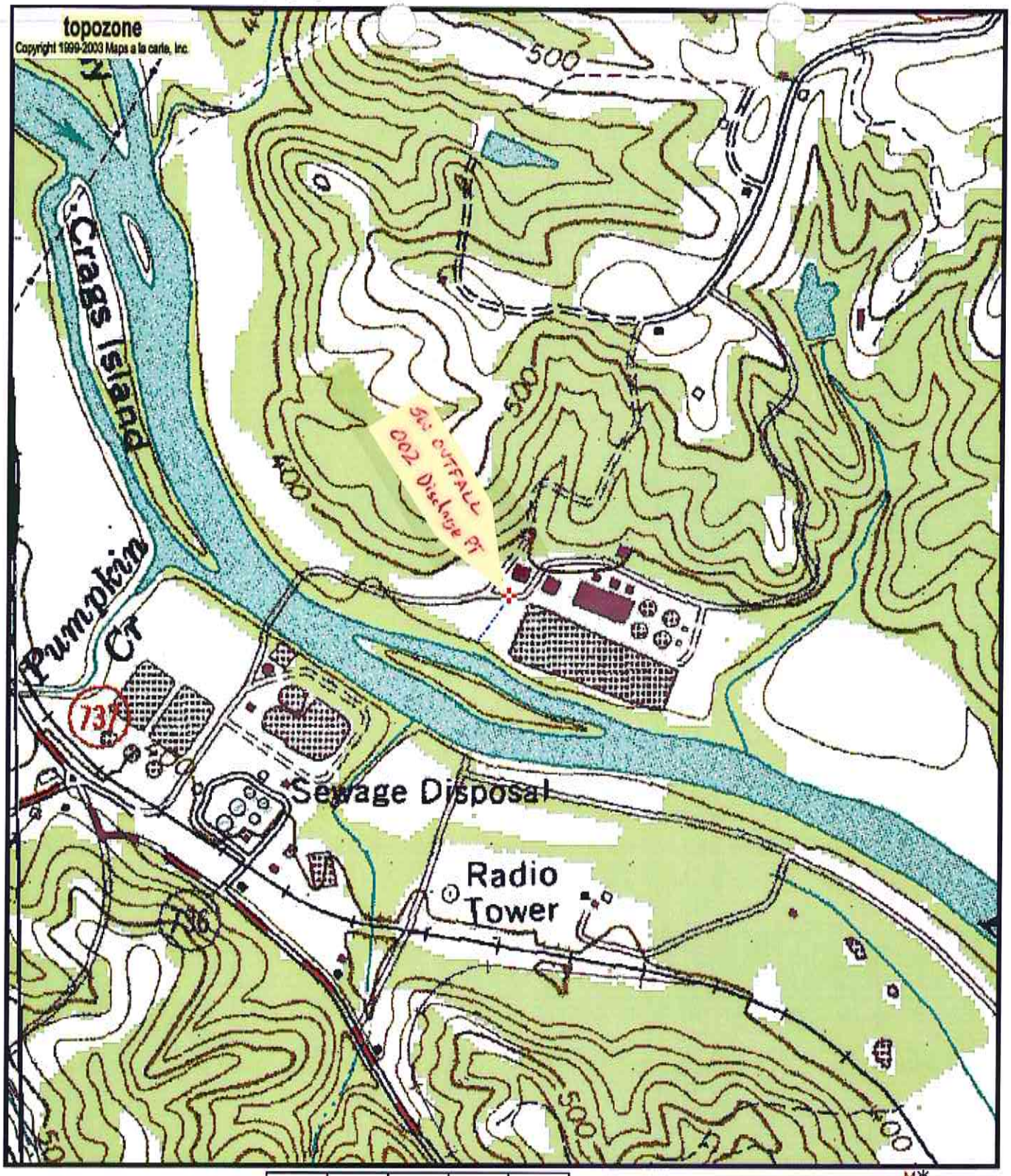
CITY OF DANVILLE – NORTHSIDE WASTEWATER TREATMENT PLANT





Map center is 36° 33' 38"N, 79° 21' 47"W (WGS84/NAD83)
Ringgold quadrangle
Projection is UTM Zone 17 NAD83 Datum

OUTFALL 001



0 0.1 0.2 0.3 0.4 0.5 km

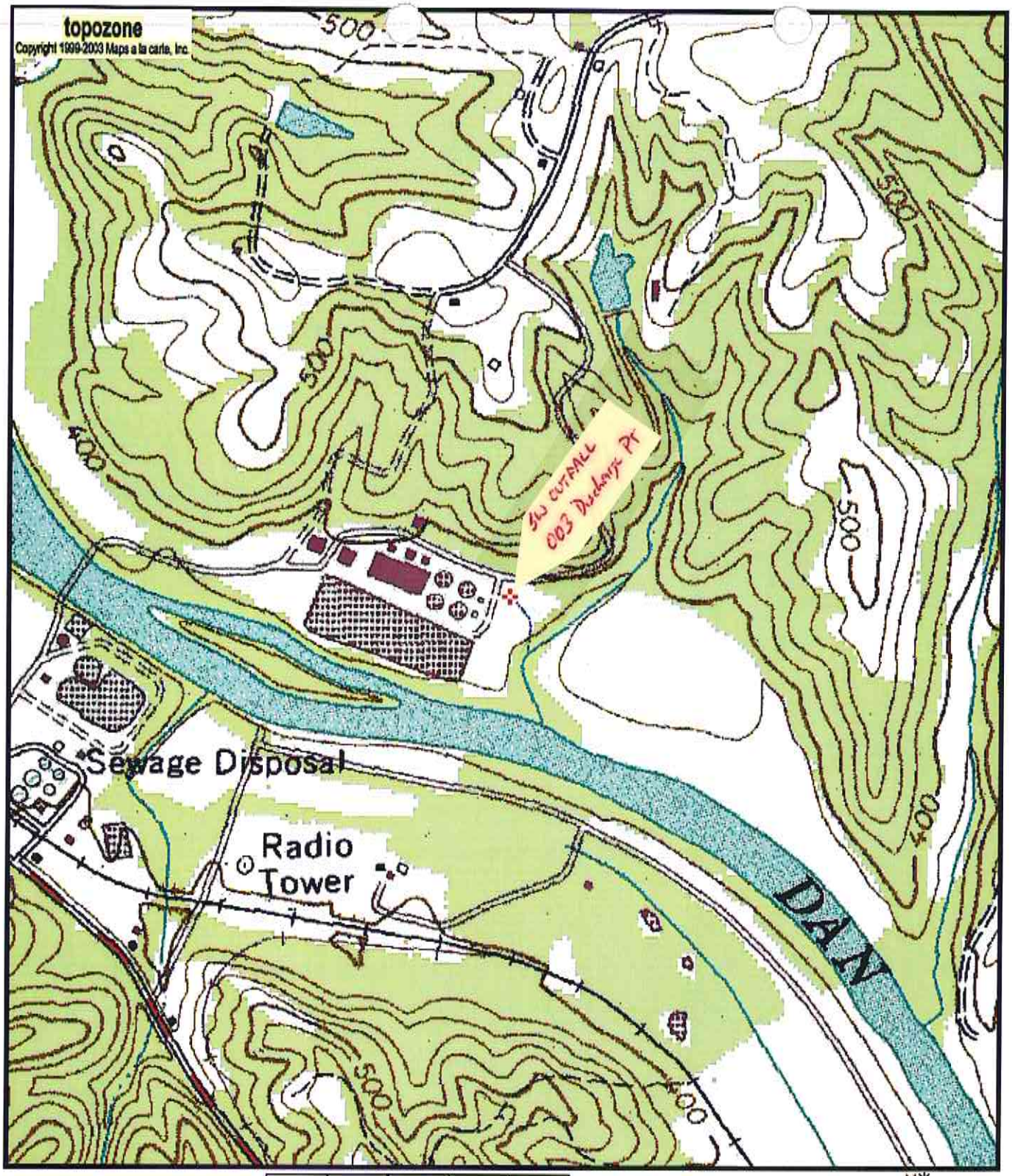
0 0.09 0.18 0.27 0.36 0.45 mi

M* G

M=-8.53
G=0.974

Map center is 36° 33' 46"N, 79° 21' 57"W (WGS84/NAD83)
Ringgold quadrangle
Projection is UTM Zone 17 NAD83 Datum

Outfall 002



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0 0.09 0.18 0.27 0.36 0.45 mi

M* G

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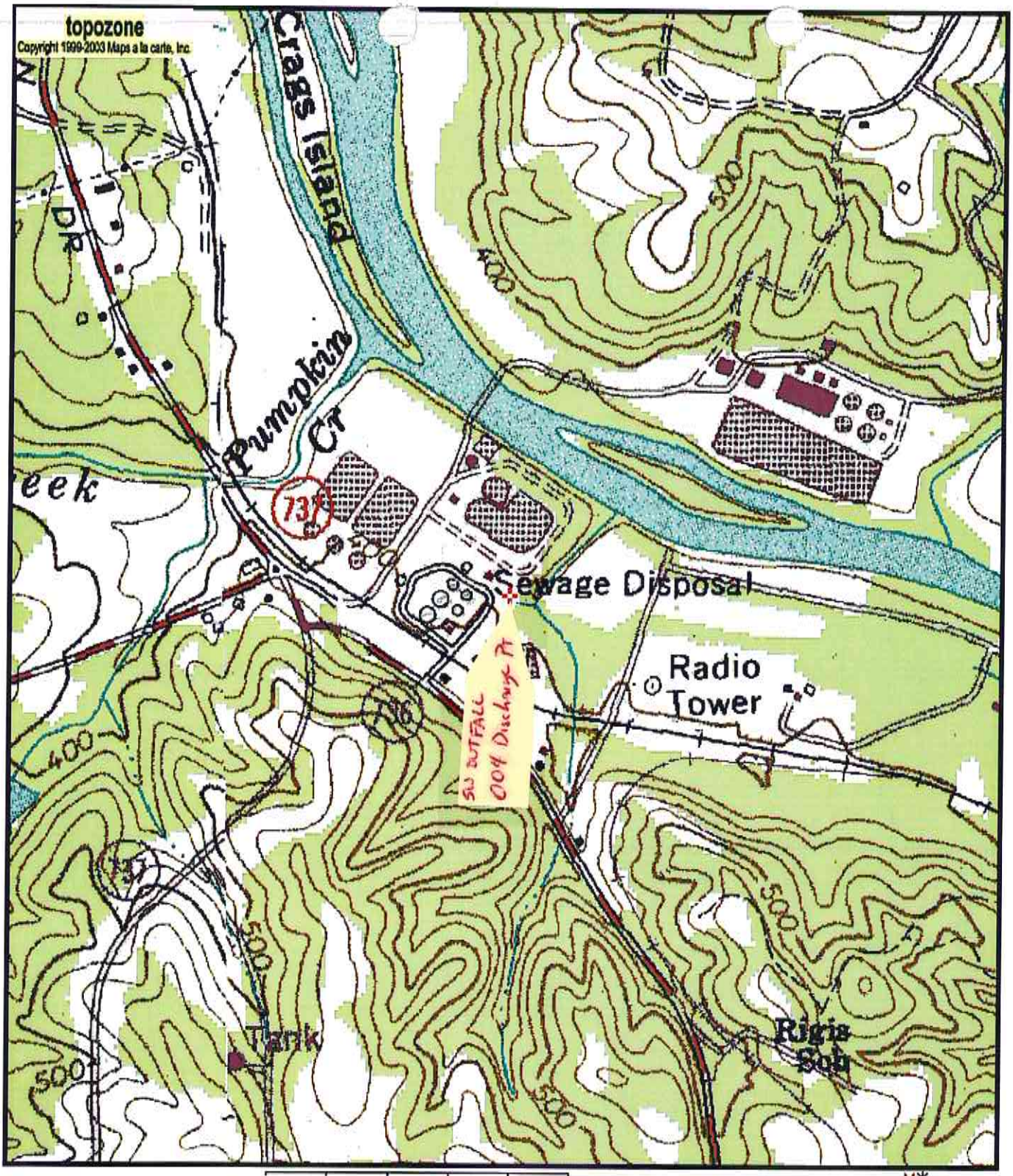
Map center is 36° 33' 45"N, 79° 21' 43"W (WGS84/NAD83)
Ringgold quadrangle
Projection is UTM Zone 17 NAD83 Datum

OUTFALL 003



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Ringgold quadrangle
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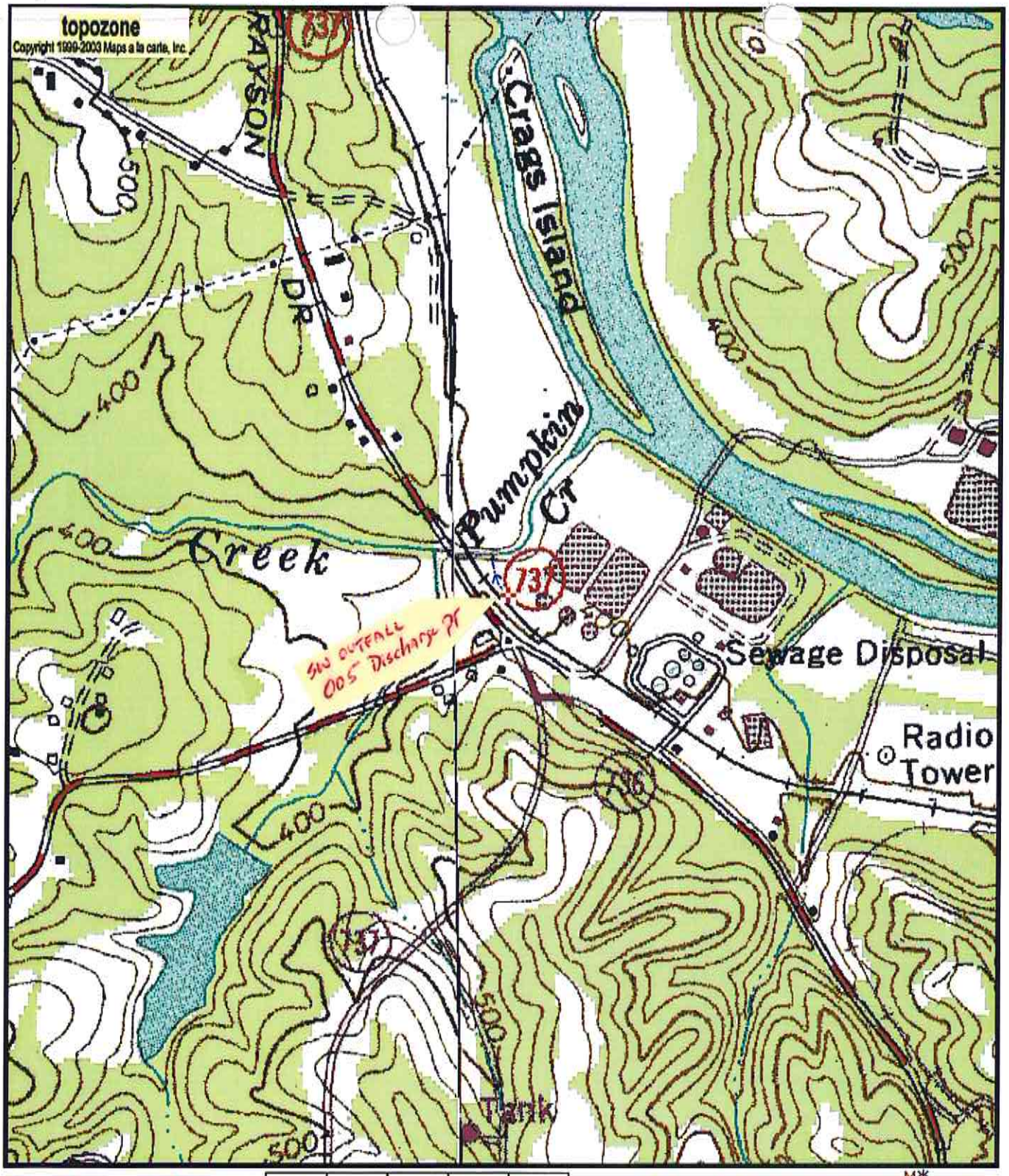
OUTFALL 004



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0 0.09 0.18 0.27 0.36 0.45 mi

M* G

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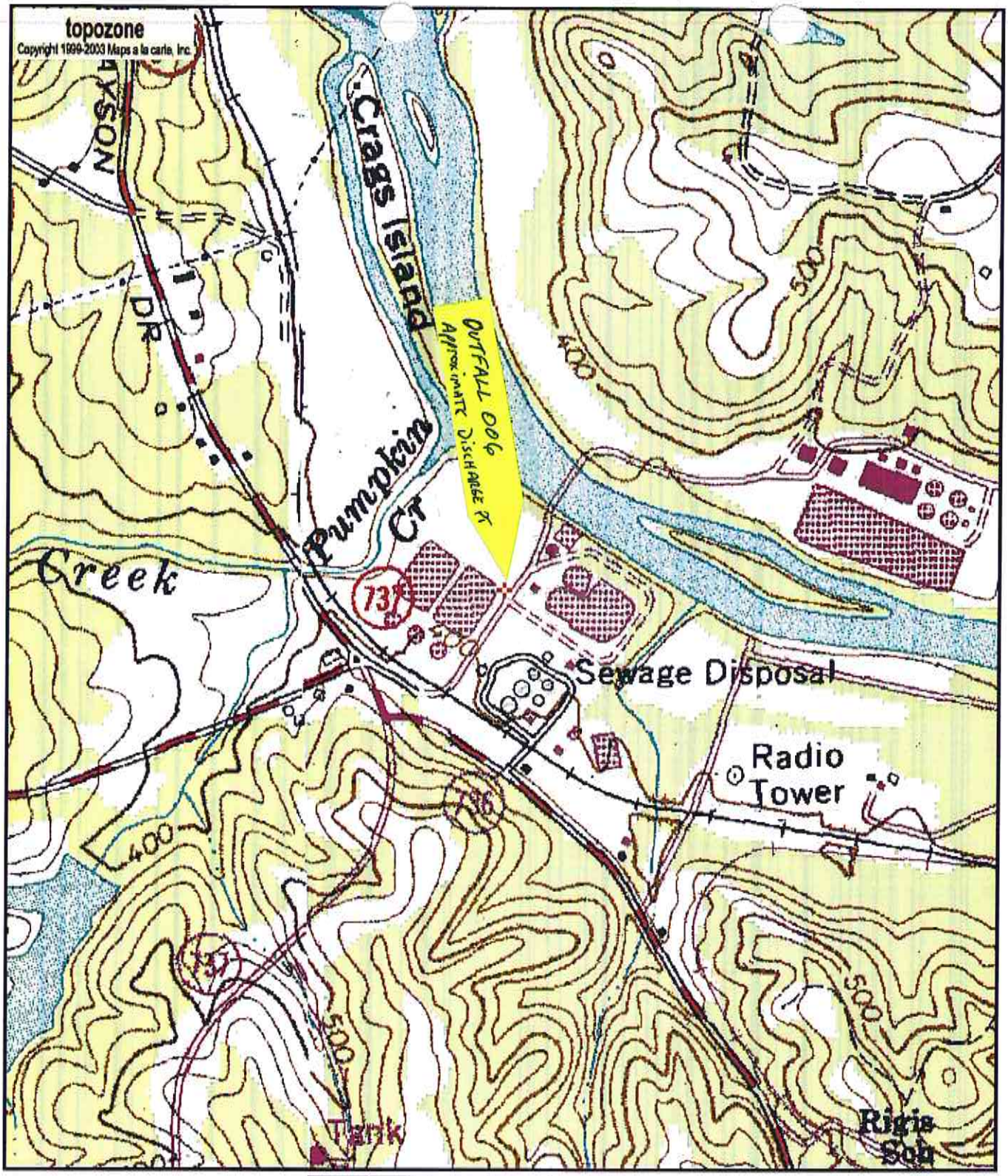
Map center is 36° 33' 39"N, 79° 22' 26"W (WGS84/NAD83)
Ringgold quadrangle
Projection is UTM Zone 17 NAD83 Datum

OUTFALL 005



0 0.1 0.2 0.3 0.4 0.5 km

0 0.09 0.18 0.27 0.36 0.45 mi

M G

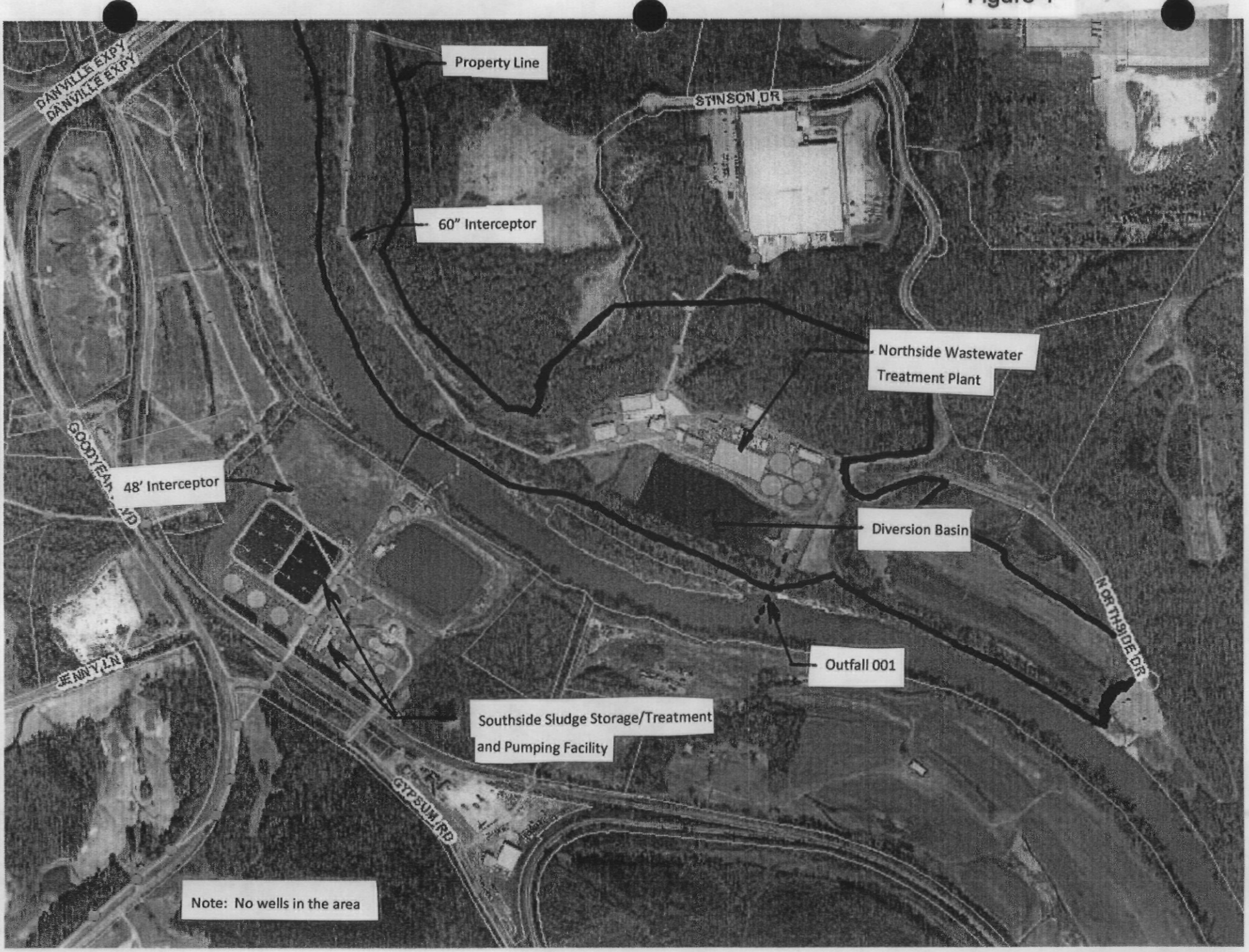
M=-8.525
G=0.971

36° 33' 40"N, 79° 22' 17"W (NAD27)

Southside Wastewater Treatment Plant, USGS Ringgold (VA,NC) Quadrangle

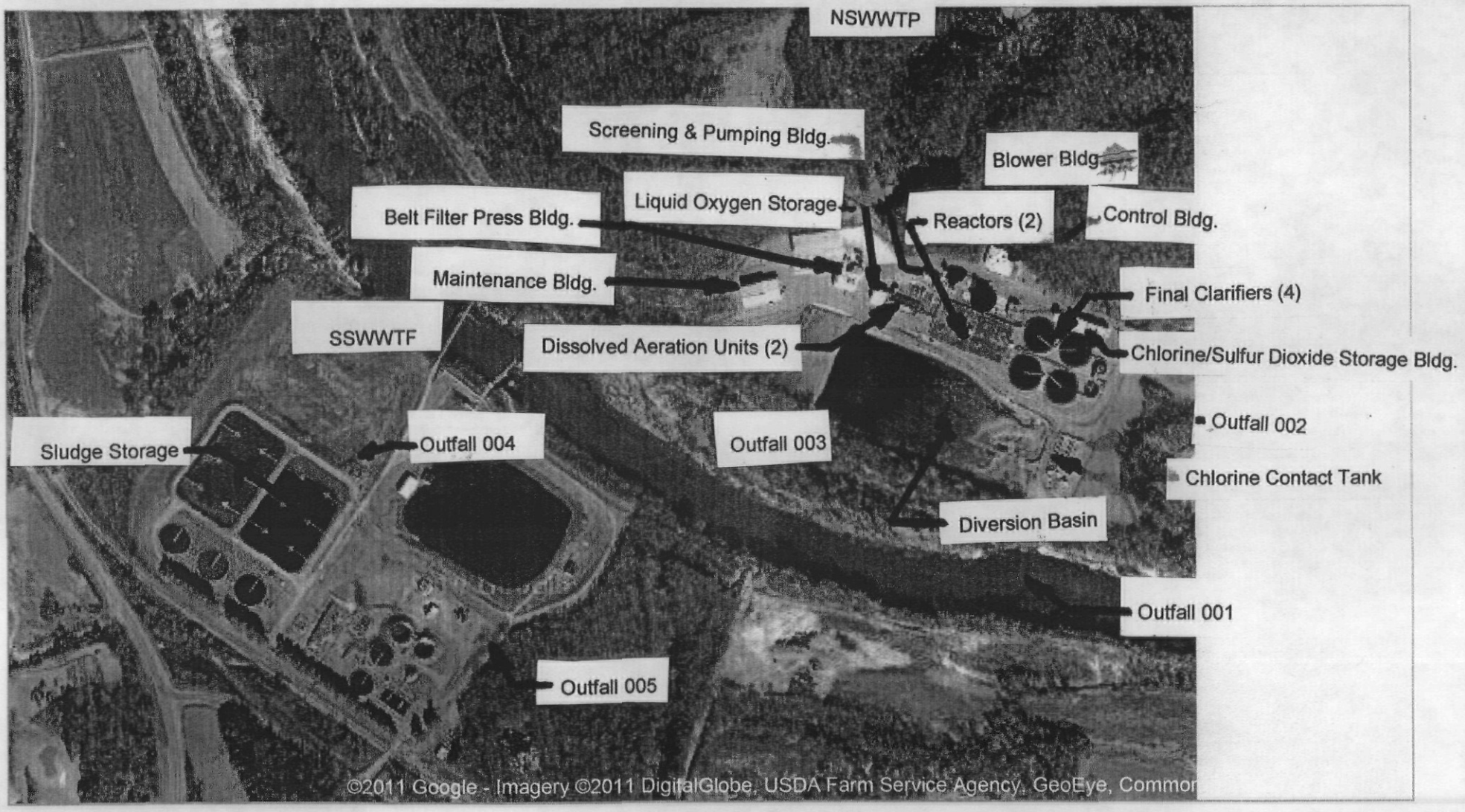
Projection is UTM Zone 17 NAD83 Datum

Figure 1



8/18/2011

Figure 5



8/22/2011

M E M O R A N D U M
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
BLUE RIDGE REGIONAL OFFICE - Roanoke
WATER DIVISION

3019 Peters Creek Road **Roanoke, Virginia 24019-2738**

SUBJECT: Site visit for VPDES Permit Reissuance - VA0060593
Danville's Northside Waste Water Treatment Plant

To: Permit file

From: Susan K. Edwards, Environmental Engineer Sr.

Date: August 17, 2012

A site visit of the Northside Waste Water Treatment Plant was performed on Tuesday, July 3, 2012, in conjunction with the reissuance of the VPDES permit for the treatment plant. Barry Dunkley, Danville's Director of Water & Wastewater Treatment, Jerry Shupe from Severn Trent Environmental Services, Charles Fiero also with Severn Trent and several other plant operators accompanied a team from DEQ for the site visit. The DEQ team included Kirk Batsel who wrote the last reissuance of the permit, two summer interns, Mattie Witt and Adam Eller, from the BRRO-Lynchburg Office and me. Severn Trent is the current contract operator for the plant and is coordinating plant upgrades and modifications construction. The renovation work is considered Phase I Improvements based on Preliminary Engineering Report recommendations made by AECOM and submitted to DEQ in January 2010.

Before touring the plant we discussed plant operations and the upcoming reissuance. The renovation and modification of the treatment plant components are on-going. The permit reissuance includes the reduction in the permitted design capacity from 24 MGD to 20 MGD. The primary reason for the reduction is the conversion in the method of wastewater treatment changed from an oxygen-fed to an ambient-air-fed aerobic activated sludge process. I addition, while continuing to operate the treatment works in compliance with the permit other renovations are being made throughout the plant to improve operation and control of the treatment process. All areas of the plant are systematically being renovated. New means of isolation of plant components and installation of additional process monitoring is being included in stages. The plant has struggled through the 2007 permit term with significantly lower flows than the design of the plant with limited ability to monitor and control through isolation various treatment components. Currently only half of the plant's parallel treatment units are being used because of the low influent flow and this has facilitated the treatment plant renovation work.

After discussion about the improvements, the entourage toured parts of the control and laboratory building. Chart recorders have been mostly replaced by digital displays with computer recording of results. We then moved out to the plant property beginning at the headworks of the treatment plant. The new equalization basin liner was obvious and there was little material being held in the basin. Two of the three bar screens were under repair during the visit. The raw sewage pumps appeared to be handling flows well. The dissolved air floatation grit removal (FGR) system was not operating well with only one side of the basin in use and experiencing problems with grit and scum removal associated with low flows, the inability to change pump rates to vary with flow and broken mechanical components. Plant operation has focused on temporary measures to keep down the scum and manage the grit accumulation. A June 2012 progress report on the Phase I improvements indicates that Danville believes they now have adequate funds to move forward to convert one and maybe both FGR systems to high rate primary clarifiers (HRPC). The Reactor Basin No. 1 was in operation and Basin No. 2 is in the process of being converted to an ambient air system. The openings on the top of the basins allow observation of wastewater as it moves through the treatment Basins once in operation and observation of the renovation work in No. 2. The No. 1 Basin is experiencing problems with foaming and the operators are addressing this with water spray and conditioning additives. There are 4 secondary clarifiers that are systematically being completely refurbished. Parts are on hand and work for each is scheduled as part of the plant upgrades. Slide gates are being installed on the chlorine contact tanks to allow each tank to be isolated from the other for improved treatment control and plant maintenance. Currently gaseous chlorine is

injected for disinfection but conversion to a hypochlorite feed system is being considered. Sulfur oxide gas is used for dechlorination. New metering, telemetry systems and valves are being installed at various locations to facilitate operational flexibility of the reconditioned plant.

After dechlorination the plant has an effluent sampling station and a junction box before the effluent reaching the river. From the banks of the Dan River we observed the river for evidence of effluent from the submerged diffuser. Unlike the photos of the discharge from the 2007 reissuance there was no foam observed but occasionally bubbles were seen confirming the location of the diffuser ports across the river. Kirk Batsel was impressed with how well the discharge looked in comparison to earlier visits.

After a break we drove to the Southside treatment area where sludge handling is performed. The sludge treatment and storage facility is two large stabilization basins. Sludge from the Northside plant is wasted to one of the two Southside basins at a time with decant water from the basins is routed back to the headworks of the Northside plant. The basins are rotated on an annual basis with the alternate year from wasting to the basin used to age the sludge to acceptable quality to be land applied by contractor currently under a permit for farm land application in North Carolina. Permit file notes indicate each spring the activated sludge storage basins 'turn over' as temperatures warm. During this time the sludge is stored in two tanks at the Northside plant, polymer added and dewatered on two sludge presses for land application. There is another smaller sludge press that is not routinely used. In addition to the waste activated sludge management operations, the Southside plant handles primary grit and solids removal from the Northside plant.

2012 Impaired Waters - 303(d) List

Category 5 - Waters needing Total Maximum Daily Load Study

Roanoke and Yadkin River Basins

Cause Group Code / Impaired Use	Water Name / Cause	Cause Category	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)	Initial List Date	TMDL Dev. Date
L43R-01-TEMP	South Mayo River						
Aquatic Life	Temperature, water	5C			4.46	2010	2022
L45R-01-HG	South Mayo River						
Fish Consumption	Mercury in Fish Tissue	5A			10.85	2010	2022
L47R-01-BEN	Horse Pasture Creek						
Aquatic Life	Benthic-Macroinvertebrate Bioassessments	5A			7.23	2010	2022
L50R-01-TEMP	Smith River						
Aquatic Life	Temperature, water	5C			9.18	2002	2014
L51L-01-HG	Philpott Reservoir						
Fish Consumption	Mercury in Fish Tissue	5A		2,813.42		2010	2022
L51R-01-HG	Goblintown Creek						
Fish Consumption	Mercury in Fish Tissue	5A			6.71	2010	2022
L51R-01-TEMP	Rennet Bag Creek						
Aquatic Life	Temperature, water	5C			11.15	2002	2014
L51R-02-TEMP	Shooting Creek						
Aquatic Life	Temperature, water	5C			6.94	2008	2020
L53R-03-BEN	Beaver Creek						
Aquatic Life	Benthic-Macroinvertebrate Bioassessments	5A			6.92	2008	2020
L53R-04-BEN	Jones Creek, UT (XMP)						
Aquatic Life	Benthic-Macroinvertebrate Bioassessments	5A			2.04	2006	2018
L54R-02-BEN	Machine Branch						
Aquatic Life	Benthic-Macroinvertebrate Bioassessments	5A			1.01	2010	2022
L54R-03-BEN	Mulberry Creek						
Aquatic Life	Benthic-Macroinvertebrate Bioassessments	5A			2.44	2010	2022
L60R-01-HG	Dan River, Banister River and Hyco River						
Fish Consumption	Mercury in Fish Tissue	5A		1,655.60	56.40	2008	2020
	Mercury in Fish Tissue	5A			5.26	2010	2020
L60R-01-PCB	Dan River, Banister River and Hyco River						
Fish Consumption	PCB in Fish Tissue	5A		1,655.60	33.73	2002	2014
	PCB in Fish Tissue	5A			2.39	2004	2016
	PCB in Fish Tissue	5A			12.25	2004	2014
	PCB in Fish Tissue	5A			8.03	2006	2014
	PCB in Fish Tissue	5A			4.19	2010	2010
	PCB in Fish Tissue	5A			1.07	2010	2014
L60R-02-BEN	Pumpkin Creek						
Aquatic Life	Benthic-Macroinvertebrate Bioassessments	5A			3.94	2012	2024
L60R-03-BEN	Cane Creek						
Aquatic Life	Benthic-Macroinvertebrate Bioassessments	5A			12.02	2012	2024

2012 TMDL ID: L60R-01-HG **ASSESSMENT CATEGORY:** 5A

2012 IMPAIRED AREA ID: VAC-L65R-01

NAME: Dan River, Banister River and Hyco Rive

LOCATION: Dan River within the state of Virginia from Schoolfield Dam in Danville downstream to the confluence with Roanoke River on John. H. Kerr Reservoir, including its tributaries Hyco River up to Rt. 738 bridge and Banister River up to the Banister Dam.

SIZE: 61.66 Miles **5th Order Watershed:** L57R

IMPAIREMENT NAME: Mercury in Fish Tissue

CYCLE FIRST LISTED: 2010 **TMDL SCHEDULE:** 2020

Notes: Station ID:
4ADAN054.03 (2007 FT Sampling)
PCB 4 Species
Hg 4 Species
4ABAN000.50 (2007 FT/Sed)
PCB 3 Species
Hg 2 Species
4ABAN008.30 (2007 FT/Sed)
PCB 3 Species
Hg 2 Species
4ADAN001.18 (2007 FT/Sed)
PCB 3 Species
Hg 3 Species
4AHYC002.70 (2007 FT/Sed)
PCB 3 Species
Hg 3 Species

VDH Fish Advisory - PCBs: Issued 10/27/99, revised 12/31/04 & Mercury: Issued 8/31/07
Dan River within the state of Virginia from the Brantley Steam Plant Dam in Danville downstream to the confluence with Roanoke River on John. H. Kerr Reservoir, including its tributaries Hyco River up to Rt. 738 bridge and Banister River up to the Banister Dam. These river segments comprise ~67 miles.
VDH recommends the following precautions to reduce any potential harmful effects from eating contaminated fish:

Eat smaller, younger fish (within the legal limits). Younger fish are less likely to contain harmful levels of contaminants than larger, older fish.
Eat fewer or smaller servings of fish.
Try to eat different species of fish from various sources (i.e., different creeks, rivers and streams).
Cleaning or cooking contaminated fish does not eliminate or reduce mercury. However, levels of PCBs in fish can be reduced by taking the following precautions:
Remove the skin, the fat from the belly and top and internal organs before cooking the fish.
Bake, broil or grill on an open rack to allow fats to drain away from the meat.
Discard the fats that cook out of the fish.
Avoid or reduce the amount of fish drippings or broth that is used to flavor the meal.
Eat less deep-fried fish, since frying seals contaminants into the fatty tissue.
For more information about fish consumption advisories, including frequently asked questions go to www.vdh.virginia.gov.

2012 TMDL ID: L60R-01-PCB **ASSESSMENT CATEGORY:** 5A

2012 IMPAIRED AREA ID: VAC-L65R-01

NAME: Dan River, Banister River and Hyco Rive

LOCATION: Dan River within the state of Virginia from Schoolfield Dam in Danville downstream to the confluence with Roanoke River on John. H. Kerr Reservoir, including its tributaries Hyco River up to Rt. 738 bridge and Banister River up to the Banister Dam.

SIZE: 61.66 Miles **5th Order Watershed:** L57R

IMPAIREMENT NAME: PCB in Fish Tissue

CYCLE FIRST LISTED: 2010 **TMDL SCHEDULE:** 2014

Notes: Station ID:
4ADAN054.03 (2007 FT Sampling)
PCB 4 Species
Hg 4 Species
4ABAN000.50 (2007 FT/Sed)
PCB 3 Species
Hg 2 Species
4ABAN008.30 (2007 FT/Sed)
PCB 3 Species
Hg 2 Species
4ADAN001.18 (2007 FT/Sed)
PCB 3 Species
Hg 3 Species
4AHYC002.70 (2007 FT/Sed)
PCB 3 Species
Hg 3 Species

VDH Fish Advisory - PCBs: Issued 10/27/99, revised 12/31/04 & Mercury: Issued 8/31/07
Dan River within the state of Virginia from the Brantley Steam Plant Dam in Danville downstream to the confluence with Roanoke River on John. H. Kerr Reservoir, including its tributaries Hyco River up to Rt. 738 bridge and Banister River up to the Banister Dam. These river segments comprise ~67 miles.
VDH recommends the following precautions to reduce any potential harmful effects from eating contaminated fish:

Eat smaller, younger fish (within the legal limits). Younger fish are less likely to contain harmful levels of contaminants than larger, older fish.
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Try to eat different species of fish from various sources (i.e., different creeks, rivers and streams).
Cleaning or cooking contaminated fish does not eliminate or reduce mercury. However, levels of PCBs in fish can be reduced by taking the following precautions:
Remove the skin, the fat from the belly and top and internal organs before cooking the fish.
Bake, broil or grill on an open rack to allow fats to drain away from the meat.
Discard the fats that cook out of the fish.
Avoid or reduce the amount of fish drippings or broth that is used to flavor the meal.
Eat less deep-fried fish, since frying seals contaminants into the fatty tissue.
For more information about fish consumption advisories, including frequently asked questions go to www.vdh.virginia.gov.

2012 Impaired Waters (Category 4A) TMDL Approved and (Category 4B) Other Control Measures Present*

Roanoke and Yadkin River Basins

Cause Group Code / Impaired Use	Water Name / Cause	Cause Category	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)	Initial List Date	TMDL Dev. Date
L53R-04-BAC	Reed Creek						
Recreation	Escherichia coli	4A			3.95	2008	2020
L54R-01-BAC	Smith River						
Recreation	Escherichia coli	4A			3.59	2008	2008
	Escherichia coli	4A			10.16	2008	2010
	Escherichia coli	4A			6.30	2008	2018
L54R-01-BEN	Smith River						
Aquatic Life	Benthic-Macroinvertebrate Bioassessments	4A			10.16	1998	2010
L55R-01-BAC	Marrowbone Creek						
Recreation	Escherichia coli	4A			4.33	2008	2010
L56R-01-BAC	Leatherwood Creek and Headwater Tributaries						
Recreation	Escherichia coli	4A			15.97	2006	2010
	Escherichia coli	4A			8.31	2008	2010
L56R-02-BAC	West Fork Leatherwood Creek						
Recreation	Escherichia coli	4A			13.83	2012	2024
L57R-04-BAC	Cascade Creek						
Recreation	Escherichia coli	4A			11.76	2006	2018
L58R-01-BAC	Sandy River						
Recreation	Escherichia coli	4A			7.21	2010	2022
L58R-02-BAC	Tanyard Creek						
Recreation	Escherichia coli	4A			2.84	2006	2018
L58R-04-BAC	Sandy River						
Recreation	Escherichia coli	4A			9.73	2006	2018
L58R-05-BAC	Sugartree Creek						
Recreation	Escherichia coli	4A			6.57	2008	2020
L58R-06-BAC	Stewart Creek						
Recreation	Escherichia coli	4A			7.28	2008	2020
L59R-01-BAC	Sandy Creek						
Recreation	Escherichia coli	4A			9.15	2008	2016
L60R-01-BAC	Dan River						
Recreation	Escherichia coli	4A			34.63	1998	2010
L60R-02-BAC	Pumpkin Creek						
Recreation	Escherichia coli	4A			3.94	2006	2018
L60R-03-BAC	Cane Creek						
Recreation	Escherichia coli	4A			12.02	2008	2020

The waste water treatment plants use chlorine for disinfection, and so use total residual chlorine as a surrogate for bacteria limits. Compliance with the chlorine contact requirements has been shown to translate to compliance with the bacteria criteria, and *E. coli* limitations are therefore not required.

Table 3-14: Individual Permitted Facilities within the Dan River Watershed, Virginia

Permit No	Facility Name	Receiving Stream	Status	Size	Category	Design Flow (GPD)
VA0052841	Colonial Pipeline Co - Witt Station	Fall Creek, UT	Active	Minor	Industrial	0.0059
VA0001627	Corning Inc - Danville	Rutledge Creek	Active	Minor	Industrial	0.692
VA0074586	Country Oaks LLC STP	Sandy Creek	Active	Minor	Municipal	0.03
VA0060593	Danville City - Northside	Dan River	Application	Major	Municipal	24
VA0001201	Goodyear Tire & Rubber Co - Danville	Hogans Creek, UT1	Active	Minor	Industrial	0.13
VA0022705	Halifax County Schools Cluster Springs Elem	Stokes Creek/U.T.	Active	Minor	Municipal	0.0051
VA0027685	Pittsylvania Co - Dan River High School	Little Fall Creek, UT	Active	Minor	Municipal	0.0104
VA0027693	Pittsylvania Co - Tunstall High School	Stewart Creek, UT	Active	Minor	Municipal	0.012
VA0089893	South Boston WTP	Poplar Creek	Active	Minor	Industrial	0.04
VA0020362	South Boston WWTP	Dan River	Active	Major	Municipal	2
VA0001554	Hanesbrands Incorporated	Smith River	Active	Major	Industrial	0.3881
VA0021989	Virginia Glass Products Corp	Machine Branch, UT	Active	Minor	Industrial	0.008
VA0023558	DOC - Patrick Henry Correctional Unit 28	Jennings Creek, UT	Active	Minor	Municipal	0.028
VA0025305	Martinsville City Sewage Treatment Plant	Smith River	Active	Major	Municipal	8
VA0029858	Carver Estates - Sewage Treatment Plant	Grassy Creek	Active	Minor	Municipal	0.06
VA0030660	DCR - Fairy Stone State Park	Hale Creek	Active	Minor	Industrial	0.0005
VA0058441	Upper Smith River Water Filtration Plant	Smith River, UT	Active	Minor	Industrial	0.096
VA0060445	Henry County Public SA - Piedmont Estates Lagoon	Mill Creek	Active	Minor	Municipal	0.04
VA0069345	Henry County PSA - Lower Smith River STP	Smith River	Active	Major	Municipal	4
VA0072354	CPFilms Inc - Plant 1	Smith River	Active	Minor	Industrial	4.2
VA0086665	Bassett Mirror Company Incorporated	Town Creek	Active	Minor	Industrial	0.0035
VA0090174	Green Acres Mobile Home Park	Tanyard Branch	Active	Minor	Municipal	0.01
VA0090280	Henry County Public SA - Greenbriar Lagoon STP	Grassy Creek	Active	Minor	Municipal	0.032
VA0090310	Philpott Dam Hydroelectric Plant	Smith River	Active	Minor	Industrial	0.0638

The estimated load reductions for the Dan River, Blackberry Creek, Byrds Branch, Double Creek, Fall Creek, Leatherwood Creek, Marrowbone Creek, North Fork Mayo River, Smith River, South Fork Mayo River, Sandy Creek, and Sandy River from these allocation scenarios are presented separately in the following sections. In addition, the percent of days the 126 cfu/100ml *E. coli* geometric mean water quality standard and the 235 cfu/100ml *E. coli* instantaneous water quality standard were violated under each scenario are presented.

5.6 Dan River (VAC-L60R-01) TMDL

5.6.1 Dan River Wasteload Allocation

There are 33 facilities in Virginia discharging bacteria to Dan River. These facilities do not have a permit limit for bacteria. For this TMDL, the wasteload allocation for such facilities is to maintain discharge at the design flow limits and bacteria concentrations at the existing *E. coli* standard of 126 cfu/100mL. **Table 5-2** shows the loading from the permitted point source dischargers in Dan River. To account for future growth, the WLA was developed using 5 times the original allocation.

Table 5-2: Dan River Wasteload Allocation for *E. coli*

Point Source	Existing Load (cfu/day)	Allocated Load (cfu/day)	Allocated Load (cfu/year)	Percent Reduction
VA0020362	9.55E+09	9.55E+09	3.48E+12	0%
VA0022705	2.43E+07	2.43E+07	8.89E+09	0%
VAG402052	2.15E+06	2.15E+06	7.84E+08	0%
VAG404018	2.15E+06	2.15E+06	7.84E+08	0%
VAG404039	2.15E+06	2.15E+06	7.84E+08	0%
VAG404043	2.15E+06	2.15E+06	7.84E+08	0%
VAG404067	1.43E+06	1.43E+06	5.23E+08	0%
VAG404095	4.77E+06	4.77E+06	1.74E+09	0%
VAG404104	4.77E+06	4.77E+06	1.74E+09	0%
VAG404108	4.77E+06	4.77E+06	1.74E+09	0%
VAG404112	4.77E+06	4.77E+06	1.74E+09	0%
VAG404119	4.77E+06	4.77E+06	1.74E+09	0%
VAG404121	2.15E+06	2.15E+06	7.84E+08	0%
VAG404123	1.43E+06	1.43E+06	5.23E+08	0%
VAG404127	4.77E+06	4.77E+06	1.74E+09	0%
VAG404138	2.15E+06	2.15E+06	7.84E+08	0%
VAG404160	2.15E+06	2.15E+06	7.84E+08	0%
VAG404163	4.77E+06	4.77E+06	1.74E+09	0%

Table 5-2: Dan River Wasteload Allocation for *E. coli*

Point Source	Existing Load (cfu/day)	Allocated Load (cfu/day)	Allocated Load (cfu/year)	Percent Reduction
VAG404173	2.15E+06	2.15E+06	7.84E+08	0%
VAG404195	4.30E+06	4.30E+06	1.57E+09	0%
VAG407197	4.77E+06	4.77E+06	1.74E+09	0%
VAG407218	2.15E+06	2.15E+06	7.84E+08	0%
VAG407220	4.77E+06	4.77E+06	1.74E+09	0%
VAG407223	2.15E+06	2.15E+06	7.84E+08	0%
VAG407240	1.43E+06	1.43E+06	5.23E+08	0%
VAG407244	2.15E+06	2.15E+06	7.84E+08	0%
VAG407245	4.77E+05	4.77E+05	1.74E+08	0%
VAG407246	2.15E+06	2.15E+06	7.84E+08	0%
VAG407247	1.43E+06	1.43E+06	5.23E+08	0%
VPG100019	2.86E+06	2.86E+06	1.04E+09	0%
VPG100049	2.86E+06	2.86E+06	1.04E+09	0%
VPG100056	2.86E+06	2.86E+06	1.04E+09	0%
VPG120007	2.86E+06	2.86E+06	1.04E+09	0%
Total	**9.66E+09**	**9.66E+09**	**3.53E+12**	**0%**
Total (Future Growth)			**1.76E+13**	**-**

5.6.2 Dan River Load Allocation

The scenarios considered for Dan River load allocation are presented in **Table 5-3**. The following conclusions can be made:

1. In Scenario 0 (existing conditions), the water quality standard was violated more than 50% of the time.
2. In Scenario 3, elimination of the human sources (failed septic systems and straight pipes) and the livestock direct instream loading resulted in a 52 percent violation of the *E. coli* geometric mean standard and a 61 percent violation of the *E. coli* instantaneous standard.
3. In Scenario 4, eliminating all sources except direct instream loading from wildlife resulted in a 3 percent violation of the *E. coli* geometric mean standard and no violation of the *E. coli* instantaneous standard.
4. No violations of the *E. coli* geometric mean standard occurred in Dan River under Scenario 11.

Therefore, Scenario 11 was chosen as the final TMDL load allocation scenario for Dan River. Under this scenario, complete elimination of the human sources (failed septic system s and straight pipes), livestock direct deposition, a 95 percent reduction of urban and agricultural nonpoint sources, and a 48 percent reduction of direct loading by wildlife are required.

Table 5-3: Dan River Load Reductions under 30-Day Geometric Mean and Instantaneous Standards for *E. coli*

Scenario	Failed Septic & Pipes	Direct Livestock	NPS (Agri-cultural)	NPS (Urban)	Direct Wildlife	*E. coli* Percent violation of GM standard 126 #/100ml	*E. coli* Percent violation of Inst. standard 235 #/100ml
0	0%	0%	0%	0%	0%	59%	61%
1	100%	0%	0%	0%	0%	59%	61%
2	100%	50%	0%	0%	0%	56%	61%
3	100%	100%	0%	0%	0%	52%	61%
4	100%	100%	100%	100%	0%	3%	0%
5	100%	100%	0%	0%	50%	38%	61%
6	100%	100%	0%	0%	75%	28%	61%
7	100%	100%	95%	95%	75%	0%	0%
8	100%	100%	89%	89%	48%	3%	10%
9	100%	50%	50%	50%	0%	36%	52%
10	100%	75%	75%	75%	0%	2%	35%
11	100%	100%	95%	95%	48%	0%	0%

5.6.3 Dan River Allocation Plan and TMDL Summary

As shown in **Table 5-3**, Scenario 11 will meet 30-day *E. coli* geometric mean water quality standard of 126 cfu/100 ml and the instantaneous water quality standard of 235 cfu/100ml for Dan River. The requirements for this scenario are:

- 100 % reduction of the human sources (failed septic systems and straight pipes).
- 100 % reduction of the direct instream loading from livestock.
- 95% reduction of bacteria loading from agricultural and urban nonpoint sources.
- 48% reduction of the direct instream loading from wildlife.

Table 5-4 shows the distribution of the annual average *E. coli* load under existing conditions and under the TMDL allocation, by land use and source. All point and nonpoint source loads presented in Table 5-4 aggregate the contributions from sources in Virginia and North Carolina. Relevant information about point and nonpoint sources

located in North Carolina is discussed in Chapter 3. It may be worth noting here that point source loads presented in Table 5-2 include contributions from sources in Virginia only.

The monthly distribution of these loads is presented in Appendix E.

Table 5-4: Dan River Distribution of Annual Average *E. coli* Load under Existing Conditions and TMDL Allocation

Land Use/Source	Average *E. coli* Loads (cfu/yr)		Allocation (cfu/day)	Percent Reduction (%)
	Existing	Future		
Forest	2.06E+13	2.06E+13	9.89E+10	0%
Cropland	3.37E+13	1.69E+12	8.10E+09	95%
Pasture	3.10E+15	1.55E+14	7.44E+11	95%
Low Density Residential	8.27E+14	4.14E+13	1.99E+11	95%
Medium Density Residential	4.33E+14	2.17E+13	1.04E+11	95%
High Density Residential	3.40E+14	1.70E+13	8.17E+10	95%
Commercial/Industrial	3.80E+14	1.90E+13	9.14E+10	95%
Failed Septic - direct deposition	1.43E+14	0.00E+00	0.00E+00	100%
Wildlife - direct deposition	5.65E+14	2.94E+14	1.41E+12	48%
Cattle - direct deposition	4.73E+10	0.00E+00	0.00E+00	100%
Point Source	3.89E+13	1.95E+14	5.33E+11	0%
Total loads /Overall reduction	**5.88E+15**	**7.65E+14**	**3.27E+12**	**87%**

The TMDL for Dan River is presented in **Table 5-5**.

Table 5-5: Dan River Bacteria TMDL (cfu/day) for *E. coli*

WLA (Point Sources)	LA (Nonpoint sources)	MOS (Margin of safety)	TMDL
5.33E+11	**2.74E+12**	**Implicit**	**3.27E+12**

The resulting geometric mean and instantaneous E. coli concentrations under the TMDL allocation plan are presented in **Figure 5-1** and **Figure 5-2**. **Figure 5-1** shows the 30-day geometric mean *E. coli* concentrations after applying the allocations of Scenario 11, as well as geometric mean loading under existing conditions. **Figure 5-2** shows the instantaneous *E. coli* concentrations also under the allocations of Scenario 11 as well as the loading under existing conditions. For the Dan River, allocation Scenario 11 results

in bacteria concentrations that are consistently below both the geometric mean and instantaneous standards for *E. coli*.

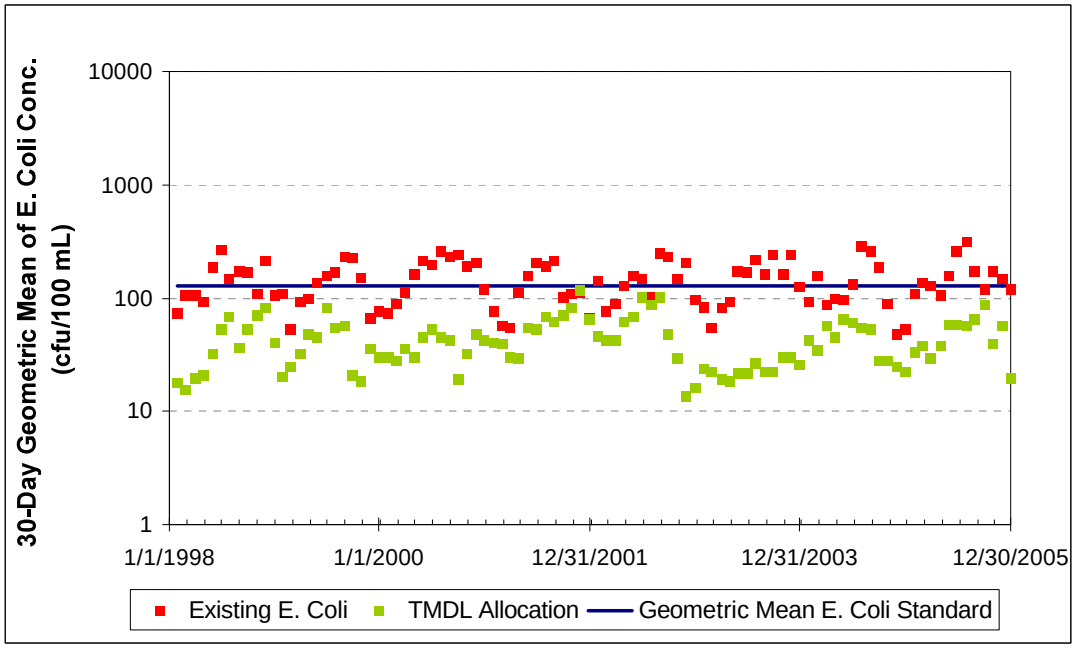


Figure 5-1: Dan River Geometric Mean *E. coli* Concentrations under Existing Conditions and Allocation Scenario 11 (Reach 2)

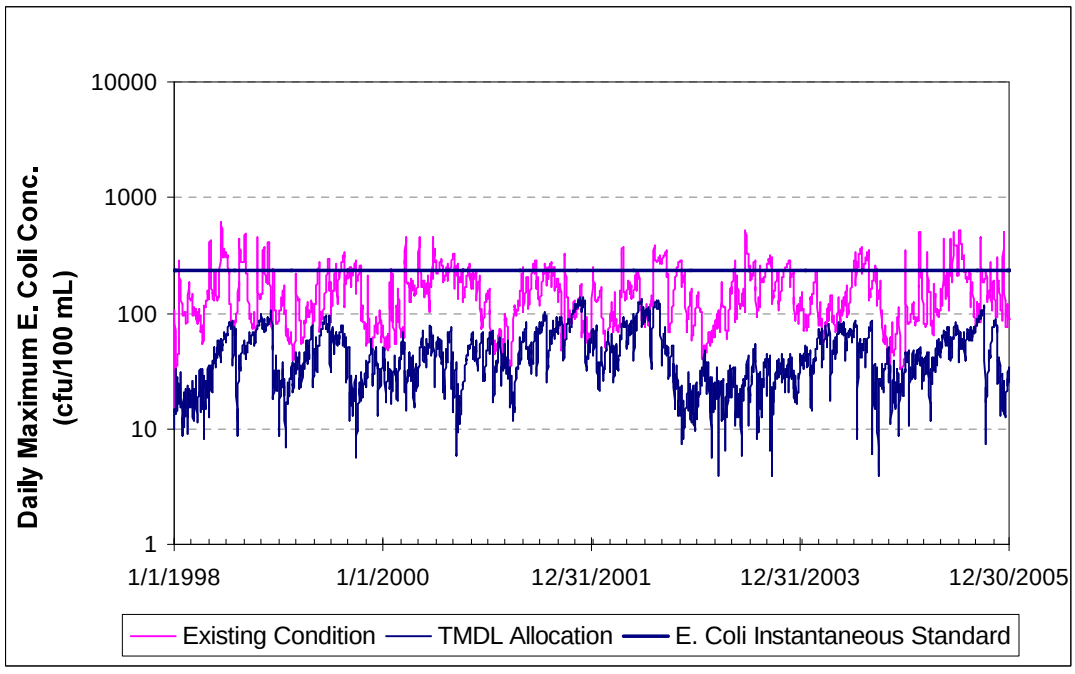


Figure 5-2: Dan River Instantaneous *E. coli* Concentrations under Allocation Scenario 11 (Reach 2)

Appendix 5 - List of Impaired (Category 5) Waters in 2012

Roanoke and Yadkin River Basins

***Cause Group Code:* L60R-02-BEN** **Pumpkin Creek**

Location: From the VA/NC line to the mouth on the Dan River

City / County: Danville Pittsylvania Co

Use(s): Aquatic Life

Cause(s) /
VA Category: Benthic-Macroinvertebrate Bioassessments / 5A

Station ID:
4APKP002.46 (2009 Bio)
IM - is in an urban watershed with abundant impervious surfaces. Flow regime and sedimentation seem to be affecting the benthic community negatively.

Pumpkin Creek	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Aquatic Life			
Benthic-Macroinvertebrate Bioassessments - Total Impaired Size by Water Type:			**3.94**

Sources:

Source Unknown

9VAC25-720-80. Roanoke River Basin.

A. Total Maximum Daily Load (TMDLs).

TMDL #	Stream Name	TMDL Title	City/County	WBID	Pollutant	WLA	Units
1.	Ash Camp Creek	Total Maximum Daily Load Development for Ash Camp Creek	Charlotte	L39R	Sediment	20.7	T/YR
2.	North Fork Blackwater River	Total Maximum Daily Load (TMDL) Development for the Upper Blackwater River Watershed	Franklin	L08R	Sediment	0	T/YR
3.	North Fork Blackwater River	Total Maximum Daily Load (TMDL) Development for the Upper Blackwater River Watershed	Franklin	L08R	Phosphorus	0	T/YR
4.	Upper Blackwater River	Total Maximum Daily Load (TMDL) Development for the Upper Blackwater River Watershed	Franklin	L08R	Sediment	0.526	T/YR
5.	Flat Creek	Benthic TMDL for Flat Creek Watershed, Virginia	Mecklenburg	L79R	Sediment	76.2	T/YR
6.	Twitty's Creek	Benthic TMDL for Twittys Creek Watershed, Virginia	Charlotte	L39R	Sediment	20.4	T/YR
7.	Roanoke River	Benthic TMDL Development for the Roanoke River, Virginia	Roanoke, Montgomery, Floyd, Botetout, Salem, Roanoke	L04R	Sediment	5,189	T/YR
8.	North Fork Roanoke River	Roanoke River PCB TMDL Development	Montgomery	L02R	tPCB	28.2	MG/YR
9.	South Fork Roanoke River	Roanoke River PCB TMDL Development	Montgomery	L01R	tPCB	230.2	MG/YR
10.	Masons Creek	Roanoke River PCB TMDL Development	Roanoke	L03R, L04R	tPCB	9.1	MG/YR
11.	Peters Creek	Roanoke River PCB TMDL Development	Botetourt, Roanoke	L04R	tPCB	65.4	MG/YR
12.	Tinker Creek	Roanoke River PCB TMDL Development	Botetourt, Roanoke	L05R	tPCB	103.9	MG/YR
13.	Wolf Creek	Roanoke River PCB	Bedford	L21R	tPCB	10.0	MG/YR

		TMDL Development					
14.	UT to Roanoke River	Roanoke River PCB TMDL Development	Bedford	L21R	tPCB	0.5	MG/YR
15.	Roanoke River (upper)	Roanoke River PCB TMDL Development	Montgomery, Botetourt, Roanoke	L03R, L04R, L12L	tPCB	28,157.7	MG/YR
16.	Goose Creek	Roanoke River PCB TMDL Development	Bedford, Campbell, Pittsylvania	L20R, L21R L22R	tPCB	0.1	MG/YR
17.	Sycamore Creek	Roanoke River PCB TMDL Development	Pittsylvania	L19R	tPCB	1.4	MG/YR
18.	Lynch Creek	Roanoke River PCB TMDL Development	Campbell	L19R	tPCB	0.1	MG/YR
19.	Reed Creek	Roanoke River PCB TMDL Development	Pittsylvania	L19R	tPCB	0.0	MG/YR
20.	X-Trib	Roanoke River PCB TMDL Development	Campbell	L19R	tPCB	0.1	MG/YR
21.	UT to Roanoke River	Roanoke River PCB TMDL Development	Campbell	L19R	tPCB	0.1	MG/YR
22.	Little Otter River	Roanoke River PCB TMDL Development	Bedford, Campbell	L26R	tPCB	0.0	MG/YR
23.	Big Otter River	Roanoke River PCB TMDL Development	Bedford, Campbell	L23R	tPCB	0.0	MG/YR
24.	Straightstone Creek	Roanoke River PCB TMDL Development	Pittsylvania	L30R	tPCB	0.0	MG/YR
25.	Seneca Creek	Roanoke River PCB TMDL Development	Campbell	L31R	tPCB	0.0	MG/YR
26.	Whipping Creek	Roanoke River PCB TMDL Development	Campbell	L30R	tPCB	0.0	MG/YR
27.	Falling River	Roanoke River PCB TMDL Development	Appomattox, Campbell	L32R	tPCB	0.0	MG/YR
28.	Childrey Creek	Roanoke River PCB TMDL Development	Halifax	L30R	tPCB	0.0	MG/YR
29.	Catawba Creek	Roanoke River PCB TMDL Development	Halifax	L36R	tPCB	0.0	MG/YR
30.	Turnip Creek	Roanoke River PCB TMDL Development	Charlotte	L36R	tPCB	0.0	MG/YR
31.	Hunting Creek	Roanoke River PCB TMDL Development	Halifax	L38R	tPCB	0.0	MG/YR
32.	Cub Creek	Roanoke River PCB TMDL Development	Appomattox, Charlotte	L37R	tPCB	0.0	MG/YR
33.	Black Walnut Creek	Roanoke River PCB TMDL Development	Halifax	L38R	tPCB	0.8	MG/YR
	Roanoke	Roanoke River PCB					

34.	Creek	TMDL Development	Charlotte	L39R	tPCB	0.0	MG/YR
35.	Difficult Creek	Roanoke River PCB TMDL Development	Halifax	L41R	tPCB	0.0	MG/YR
36.	Roanoke River	Roanoke River PCB TMDL Development	Appomattox, Campbell, Charlotte, Pittsylvania, Halifax	L19R	tPCB	1,931.8	MG/YR

B. Non-TMDL waste load allocations.

Water Body	Permit No.	Facility Name	Outfall No.	Receiving Stream	River Mile	Parameter Description	WLA	Units WLA
VAW-L04R	VA0072389	Oak Ridge Mobile Home Park	001	Falling Creek UT	0.32	BOD_5	0.85	KG/D
VAW-L04R	VA0025020	Roanoke City Regional Water Pollution Control Plant	001	Roanoke River	201.81	BOD_5 TKN, APR-SEP TKN, OCT-MAR	1173 318 636	KG/D KG/D KG/D
			001	Roanoke River	201.81	BOD_5 TKN, APR-SEP TKN, OCT-MAR	1173 416 832	KG/D KG/D KG/D
			001	Roanoke River	201.81	BOD_5 TKN, APR-SEP TKN, OCT-MAR	1173 469 939	KG/D KG/D KG/D
VAW-L04R	VA0077895	Roanoke Moose Lodge	001	Mason Creek	7.79	BOD_5, JUN-SEP TKN, JUN-SEP	0.24 0.09	KG/D KG/D
VAW-L07R	VA0020842	Bedford County School Board-Stewartsville Elementary School	001	Nat Branch, UT	0.59	BOD_5	0.5	KG/D
VAW-L14R	VA0029254	Ferrum Water and Sewage Auth. - Ferrum Sewage Treatment Plant	001	Storey Creek	9.78	BOD_5	14.2	KG/D
VAW-L14R	VA0085952	Rocky Mount Town Sewage Treatment Plant	001	Pigg River	52	BOD_5	133	KG/D
VAW-L14R	VA0076015	Ronile Incorporated	001	Pigg River	57.24	BOD_5	14.8	KG/D
VAW-L21R	VA0063738	Bedford County School Board - Staunton River High School	001	Shoulder Run, UT	0.95	BOD_5	1.8	KG/D

VAW-L21R	VA0020869	Bedford County School Board - Thaxton Elementary School	001	Wolf Creek, UT	0.35	BOD_5	0.31	KG/D
VAW-L22R	VA0023515	Blue Ridge Regional Jail Auth. - Moneta Adult Detention Facility STP	001	Mattox Creek, UT	3.76	BOD_5	1.66	KG/D
VAW-L25R	VA0020851	Bedford County School Board - Otter River Elementary School	001	Big Otter River, UT	1.15	BOD_5	0.4	KG/D
VAW-L26R	VA0022390	Bedford City - Sewage Treatment Plant	001	Little Otter River	14.36	BOD_5	52.8	KG/D
VAW-L26R	VA0020818	Bedford County School Board - Body Camp Elementary	001	Wells Creek, UT	2.22	BOD_5	0.4	KG/D
VAW-L27R	VA0020826	Bedford County School Board - New London Academy	001	Buffalo Creek, UT	0.67	BOD_5	0.39	KG/D
VAC-L29R	VA0031194	Briarwood Village Mobile Home Park STP	001	Smith Branch, UT	2.82	BOD_5	1.3	KG/D
VAC-L35R	VA0023965	Campbell Co Util & Serv Auth. - Rustburg	001	Mollys Creek	17.81	BOD_5	8.13	KG/D
VAC-L39R	VA0084433	Drakes Branch WWTP	001	Twitty's Creek	6.04	BOD_5	6.4	KG/D
VAC-L39R	VA0024058	Keysville WWTP	001	Ash Camp Creek	7.63	$CBOD_5$, MAY-NOV TKN, MAY-NOV	32.1 7.57	KG/D KG/D
AC-L39R	VA0050822	Westpoint Stevens Inc Drakes Branch	001	Twittys Creek	7.22	BOD_5	6.31	KG/D
VAW-L43R	VA0022985	Stuart Town - Sewage Treatment Plant	001	South Mayo River	30.78	BOD_5	63.5	KG/D
VAW-L54R	VA0069345	Henry Co Public Service Auth. - Lower Smith	001	Smith River	19.4	BOD_5	257	KG/D

		River STP						
VAW-L54R	VA0025305	Martinsville City Sewage Treatment Plant	001	Smith River	22.69	BOD_5	681	KG/D
VAC-L60R	VA0060593	Danville City - Northside	001	Dan River	53.32	BOD_5, JUN-OCT TKN, JUN-OCT	1907 1817	KG/D KG/D
VAC-L66R	VA0020524	Town of Chatham STP	001	Cherrystone Creek	2.49	$CBOD_5$ TKN	64.8 38.9	KG/D KG/D
VAC-L75L	VA0020168	Clarksville WWTP	001	Blue Creek/John H. Kerr Reservoir	0.1	BOD_5	59.5	KG/D
VAC-L77R	VA0076881	Chase City Regional WWTP	001	Little Bluestone Creek	13.67	$CBOD_5$, MAY-NOV TKN, MAY-NOV	29.5 9.5	KG/D KG/D
VAC-L78R	VA0026247	Boydton WWTP	001	Coleman Creek	3.79	$CBOD_5$, MAY-NOV TKN, MAY-NOV	17.7 4.1	KG/D KG/D
VAC-L79R	VA0069337	South Hill WWTP	001	Flat Creek	8.95	$CBOD_5$, APR-NOV	60.6	KG/D

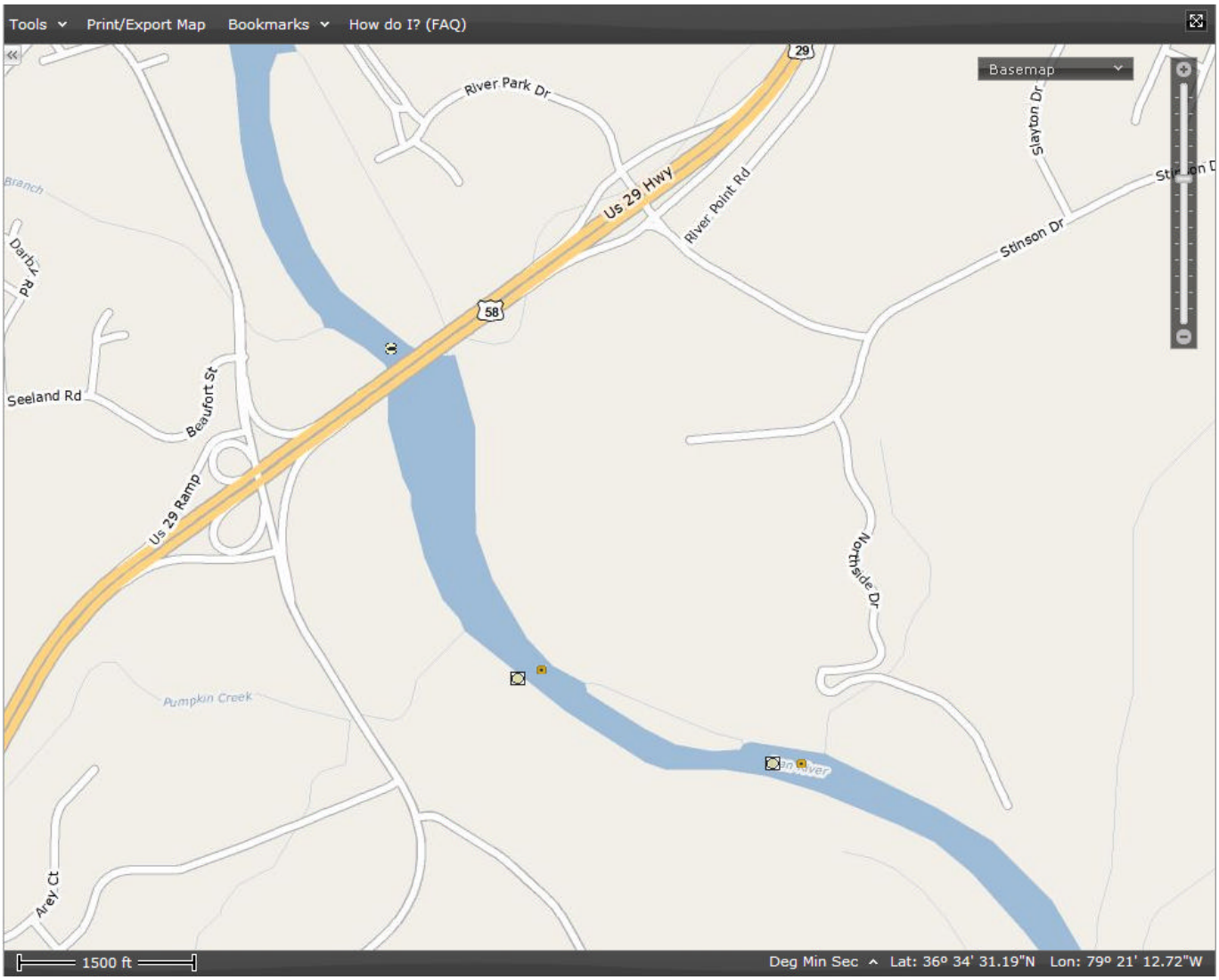
Statutory Authority

§ 62.1-44.15 of the Code of Virginia; 33 USC § 1313(e) of the Clean Water Act.

Historical Notes

Derived from Virginia Register Volume 19, Issue 14, eff. April 24, 2003; Errata, 19:18 VA.R. 2746, 2747 May 19, 2003; amended, Virginia Register Volume 21, Issue 9, eff. February 9, 2005; Volume 21, Issue 12, eff. March 23, 2005; Volume 21, Issue 17, eff. June 1, 2005; Volume 22, Issue 6, eff. December 28, 2005; Volume 23, Issue 11, eff. March 21, 2007; Volume 23, Issue 23, eff. October 22, 2007; Volume 27, Issue 12. eff. March 16, 2011.

VEGIS Monitoring station & outfall locations



Danville Northside WWTP outfall 001 discharge at 53.32 river mile.

STORET station 4ADAN053.40 at river mile 53.40, upstream of discharge

Danville Northside WWTP & STORET station river mile locations

STORET river data
Station ID 4ADAN053.40
Upstream man-bridge over Dan River between Northside & Southside plants

Date	Temp (C)	DO (mg/L)	pH (su)	Hardness (mg/L CaCO)
1/31/2007	3.7	14.8	6.7	20
3/12/2007	10.8	12.5	7	20
5/7/2007	17.6	12.2	-	26
7/17/2007	27.6	8.6	7.7	22
9/12/2007	26.4	8.7	7.9	24
11/27/2007	10.2	14.8	8.5	
1/23/2008	4.6	15.1	8.4	
3/25/2008	11.9	13.1	8.3	
5/8/2008	21.2	8.2	7.4	
7/14/2008	27.3	7.3	7.3	
9/10/2008	24.1	7.9	7.3	
11/18/2008	7.8	9.9	7.6	

Mean hardness (mg/L as $CaCO_3$) =	22.4	
90% Temperature (annual) (C) =	27.21	
90% Temperature (wet season) (C) =	19.4	(Jan. - May)
90% Maximum pH =	8.4	
10% Maximum pH =	7.0	

VPDES Permit VA0060593
Danville – Northside WWTP
Reissuance 2014

ATTACHMENT B

- Mix analysis from 2007 reissuance Fact Sheet with 12 mgd & 24 mgd flows and 18 & 31-port effluent diffuser
- 36 months DMR data - flow, pH, BOD_5, TSS, DO & seasonal TKN
- Effluent temperature for 2 years
- Effluent pH for 2 years
- Effluent hardness data from TMP samples
- Effluent data for application Form 2A: Chromium, Copper, Nickel, Silver, Zinc, Cyanide, Nitrate + Nitrite, Total Phosphorus, Hardness, Total Dissolved Solids, additional Nitrate + Nitrite data, additional Total Phosphorus data and E. coli data
- Waste Load Allocation spreadsheet (MSTRANTI 2b)
- STATS.exe printout for evaluation of Ammonia (high flow months & low flow months), Total Residual Chlorine, Chromium III, Copper, Nickel, Silver, Zinc and Cyanide
- STATS.exe printout for evaluation of parameters with Human Health WLAs: antimony, bromoform, chlorodibromo-methane, chloroform and dichlorobromo-methane
- Whole Effluent Toxicity WETLIM10 spreadsheet for 20 mgd flow (pages 1 provides the WLAs for use in STATS.exe software from C. dubia data entered on page 4)
- STATS.exe printout for reasonable potential evaluation of WET data for *C. dubia*
- Stormwater 2F Summary data and benchmark values

Mixing Zone Analysis

(excerpt from 2007 Northside STP VPDES Fact Sheet)

During the initial site inspection associated with the permit renewal (2/3/06), City staff requested a flow-tiered permit due to the loss of significant industrial influent flows. The staff requested a 12 MGD tier in addition to the present 24 MGD tier. Additionally, it was noted on this date that the existing rapid effluent diffuser appeared to be partially blocked. Based on both of these issues, it became apparent that a mixing zone analysis model was necessary to determine the current mix associated with the existing status of the diffuser and at the lower effluent flow tier of 12 MGD. The city was given the option of using the DEQ desktop model (Bank discharge) or of generating their own model in support of their request. The City elected to generate a model for this reissuance, using the resources of the consultant Hazen & Sawyer and Mr. Bob Fergen. The initial assumption was that approximately 15 ports were still functional. In order to confirm this, DEQ requested that the city to perform an effluent dye study. This presence/absence dye study was conducted on June 21, 2006. K. Batsel observed this event. The study evidenced that 17 ports were still discharging effluent via the diffuser. The dye study indicated that ports 1-16 and 18 were discharging. Subsequently, the permittee elected to clear port 17 which results in a total of 18 ports diffusing the effluent. Ultimately, this scenario was utilized in modeling which produced results dated 8/16/06, received in the SCRO on 8/18/06.

The results of this analysis were incorporated into the assessment of effluent limitations and monitoring during this reissuance. Results of this model may be found in Attachment 7.

The results of the model were presented as Instream Waste Concentrations (IWC) for both acute and chronic scenarios. All four of the potential discharge configurations (12 MGD/18 Ports, 12 MGD/31 Ports, 24 MGD/18 Ports, and 24 MGD/31 Ports) were assessed. The IWC endpoints were assessed using MSTRANTI.xls utilizing the following formula for input:

IWC = 0.108 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.108 = 1/(Qr +1)
0.108*Qr + 0.108 = 1
Qr = 8.26

The actual permitted flow of 12 or 24 MGD was then multiplied by Qr (in this example case 8.26) resulting in the MSTRANTI.xls input for critical river flow (99.12 or 198.24 MGD). The actual calculations are as follows:

12 MGD PLANT

12/18 Port configuration

Acute IWC = 0.154 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.154 = 1/(Qr + Qe)
0.154*Qr + 0.154 = 1
Qr = 5.49

5.49(12 MGD) = 65.88 = Qr for MSTRANTI.xls

12/31 Port configuration

Acute IWC = 0.096 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.096 = 1/(Qr + Qe)
0.096*Qr + 0.096 = 1
Qr = 9.41

9.41(12 MGD) = 112.9 = Qr for MSTRANTI.xls

12/18 Port configuration

Chronic IWC = 0.099 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.099 = 1/(Qr + Qe)
0.099*Qr + 0.099 = 1
Qr = 9.10

9.10(12 MGD) = 109.2 = Qr for MSTRANTI.xls

12/31 Port configuration

Chronic IWC = 0.060 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.060 = 1/(Qr + Qe)
0.060*Qr + 0.060 = 1
Qr = 15.6

15.6(12 MGD) = 187.2 = Qr for MSTRANTI.xls

12/18 Port configuration (**Ammonia Only**)

Chronic IWC = 0.078 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.078 = 1/(Qr + Qe)
0.078*Qr + 0.078 = 1
Qr = 11.82

11.82(12 MGD) = 141.8 = Qr for MSTRANTI.xls

12/31 Port configuration (**Ammonia Only**)

Chronic IWC = 0.047 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.047 = 1/(Qr + Qe)
0.047*Qr + 0.047 = 1
Qr = 20.27

20.27(12 MGD) = 243.2 = Qr for MSTRANTI.xls

24 MGD PLANT

24/18 Port configuration

Acute IWC = 0.267 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.267 = 1/(Qr + Qe)
0.267*Qr + 0.267 = 1
Qr = 2.74

2.74(24 MGD) = 65.76 = Qr for MSTRANTI.xls

24/31 Port configuration

Acute IWC = 0.176 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.176 = 1/(Qr + Qe)
0.176*Qr + 0.176 = 1
Qr = 4.68

4.68(24 MGD) = 112.3 = Qr for MSTRANTI.xls

24/18 Port configuration

Chronic IWC = 0.180 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.180 = 1/(Qr + Qe)
0.180*Qr + 0.180 = 1
Qr = 4.55

4.55(24 MGD) = 109.2 = Qr for MSTRANTI.xls

24/31 Port configuration

Chronic IWC = 0.114 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.114 = 1/(Qr + Qe)
0.114*Qr + 0.114 = 1
Qr = 7.77

7.77(24 MGD) = 186.4 = Qr for MSTRANTI.xls

24/18 Port configuration (**Ammonia Only**)

Chronic IWC = 0.145 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.145 = 1/(Qr + Qe)
0.145*Qr + 0.145 = 1
Qr = 5.89

5.89(24 MGD) = 141.3 = Qr for MSTRANTI.xls

24/31 Port configuration (**Ammonia Only**)

Chronic IWC = 0.091 = Qe/(Qr + Qe)
Substituting 1 for Qe...

0.091 = 1/(Qr + Qe)
0.091*Qr + 0.091 = 1
Qr = 9.989

9.989(24 MGD) = 239.7 = Qr for MSTRANTI.xls

DMR Data Summary - Outfall 001 **VPDES VA0060593**
Danville City - Northside

	Flow		pH		BOD5				TSS				DO	TKN (Jun - Dec)			
DMR Due Date	Qty Avg (MGD)	Qty Max (MGD)	Min (su)	Max (su)	Qty Avg (kg/d)	Qty Max (kg/d)	Conc Avg (mg/L)	Conc Max (mg/L)	Qty Avg (kg/d)	Qty Max (kg/d)	Conc Avg (mg/L)	Conc Max (mg/L)	Min (mg/L)	Qty Avg (kg/d)	Qty Max (kg/d)	Conc Avg (mg/L)	Conc Max (mg/L)
10-Apr-10	7.67	14.10	6.0	6.5	630	675	22	25	765	944	26	30	5.9				
10-May-10	6.65	9.57	6.0	6.5	450	780	17	27	477	673	20	30	6.8				
10-Jun-10	6.44	12.05	6.0	6.5	359	464	15	16	338	486	14	17	6.0				
10-Jul-10	5.66	6.62	6.0	6.4	173	171	8	8	295	303	14	14	5.9	317	790	15	38
10-Aug-10	5.23	5.87	6.0	6.5	85	90	4	5	479	598	24	29	6.1	80	102	4	5
10-Sep-10	6.06	10.35	6.0	6.5	202	382	8	15	675	867	29	34	6.0	326	604	13	23
10-Oct-10	5.75	14.24	6.0	6.4	182	207	9	9	416	444	19	20	5.6	180	254	8	12
10-Nov-10	5.74	9.48	6.0	6.4	99	132	5	6	275	343	13	17	6.2	67	85	3	4
10-Dec-10	4.81	6.23	6.0	6.4	87	101	5	6	244	284	14	16	6.6	58	69	3	4
10-Jan-11	5.08	5.93	6.0	6.3	161	145	8	7	316	352	17	19	7.1	141	150	7	8
10-Feb-11	5.31	6.05	6.1	6.6	248	249	12	13	237	274	12	13	7.3				
10-Mar-11	5.15	6.10	6.1	6.5	281	302	14	16	225	226	12	12	7.6				
10-Apr-11	6.12	7.66	6.1	6.4	334	399	14	15	261	275	11	12	7.1				
10-May-11	5.59	6.66	6.1	6.2	333	376	16	18	346	429	16	21	6.0				
10-Jun-11	5.55	7.58	6.0	6.5	376	443	18	19	420	548	20	25	6.2				
10-Jul-11	4.73	6.23	6.1	6.7	228	309	13	15	249	329	14	17	6.0	387	422	21.6	21
10-Aug-11	4.73	6.30	6.0	6.5	188	274	10	13	219	291	12	14	5.7	298	461	16	23
10-Sep-11	4.29	5.88	6.0	6.3	83	168	5	10	294	724	18	45.6	5.9	49	91	3	6
10-Oct-11	5.23	8.63	6.1	6.5	92	159	5	8	181	313	9	16	6.1	115	330	6	17
10-Nov-11	5.41	7.77	6.0	6.4	58	67	3	3	109	132	5	7	6.4	39	40	2	2
10-Dec-11	6.07	7.94	6.0	6.5	73	77	3	3	151	160	6	6	6.9	41	44	2	2
10-Jan-12	6.01	6.80	6.0	6.3	85	116	4	5	148	174	6	8	6.7	74	146	3	6
10-Feb-12	5.54	7.26	6.1	6.3	238	582	12	31	227	353	11	18	7.6				
10-Mar-12	5.64	7.52	6.1	6.7	146	176	7	8	169	178	8	8	6.7				
10-Apr-12	6.39	8.12	6.2	6.6	422	572	17	20	318	466	13	16	7.0				
10-May-12	5.67	7.32	6.1	6.8	410	516	19	22	277	412	13	18	6.4				
10-Jun-12	5.60	11.38	6.0	6.3	248	371	11	15	308	367	15	17	6.5				
10-Jul-12	6.24	9.33	6.0	6.8	341	567	15	22	478	620	20	24	6.5	295	482	12	19
10-Aug-12	6.52	8.59	6.0	6.5	109	142	4	6	372	457	15	19	6.2	70	77	3	3
10-Sep-12	6.37	8.02	6.0	6.5	82	103	3	4	308	403	13	16	6.5	95	146	4	6
10-Oct-12	6.30	8.30	6.0	7.0	74	87	3	3	216	252	9	11	6.5	57	68	2	3
10-Nov-12	6.31	7.78	6.2	7.1	66	111	3	4	154	246	6	9	6.5	47	66	2	3
10-Dec-12	5.87	6.85	6	6.6	98	138	4	6	144	190	6	8	6.9	51	74	<2	3
10-Jan-13	5.66	8.67	6	7.3	99	140	4	6	177	244	8	10	6	59	86	2	4
10-Feb-13	7.97	17.3	6	6.8	317	549	10	12	591	1087	17	23	6.3				
10-Mar-13	6.67	9.07	6	6.6	217	241	8	10	453	475	18	20	7.5				
Limits:	**12.0**	**NL**	**6.0**	**9.0**	**1362**	**2043**	**30**	**45**	**1362**	**2043**	**30**	**45**	**6.0**	**908**	**1362**	**20**	**30**

Effluent Temperature

Effluent Temp Average (ºF) **90% temp = 76.0 24.4** **Wet season (Jan- May) 90% temp = 65.0 18.3**

Date	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Oct-10	Nov-10	Dec-10	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jun-12	Jul-12	Aug-12	Sep-12
1	54	52	55	56	63	55	59	57	60	62	69	66	62	68	73	76	77	72	68	60	69	73	76	75
2	55	52	54	56	63	55	57	56	61	62	70	66	60	69	74	79	77	71	68	60	70	73	74	75
3	54	52	55	56	62	55	56	56	62	64	72	65	60	69	73	77	76	70	64	60	67	76	77	75
4	54	53	55	57	64	54	56	55	62	65	69	64	60	69	73	77	76	72	64	60	67	73	75	76
5	53	53	54	57	63	56	56	55	61	65	69	66	60	70	72	77	76	71	62	62	69	75	75	75
6	53	52	55	57	63	56	56	55	61	65	70	65	59	71	73	78	76	71	63	65	67	73	75	77
7	53	52	53	57	63	56	57	55	61	64	70	64	57	71	73	78	75	71	62	64	69	74	77	77
8	53	52	53	58	62	57	60	58	60	67	70	64	57	69	73	77	75	70	64	61	69	75	76	75
9	52	53	53	58	62	57	57	58	60	66	70	66	58	69	74	78	76	70	64	59	68	74	76	77
10	52	53	54	58	63	56	56	56	60	67	70	64	58	70	73	77	75	71	64	60	68	74	79	76
11	53	53	54	58	65	56	57	56	61	67	71	65	57	70	74	78	75	71	64	59	69	75	78	76
12	53	53	54	59	64	56	54	57	60	65	70	64	58	70	76	78	74	72	65	58	68	75	77	75
13	53	53	54	59	64	54	55	59	62	64	70	64	56	70	75	80	74	70	65	60	70	74	77	74
14	53	52	55	58	65	54	55	59	61	64	72	64	56	70	75	80	77	70	63	60	70	74	78	74
15	53	52	54	59	64	55	56	59	61	65	70	63	55	70	74	79	75	71	68	59	70	75	77	75
16	53	52	55	60	64	56	59	65	62	66	70	63	55	70	77	80	74	71	66	59	71	75	76	74
17	53	53	55	59	65	56	57	60	62	66	70	64	56	71	77	80	73	71	63	59	70	75	76	76
18	53	54	56	58	64	55	57	60	63	67	69	64	56	71	76	77	72	73	61	58	71	76	77	76
19	53	54	57	60	64	55	57	60	63	67	70	64	56	70	78	78	74	70	60	57	72	76	77	75
20	54	54	57	60	64	55	55	62	63	67	69	64	55	70	79	78	75	68	63	57	72	76	77	72
21	53	54	57	61	65	55	55	64	63	68	69	63	55	72	76	78	73	68	62	58	72	76	77	72
22	54	54	57	60	65	54	57	61	62	68	70	64	55	72	77	81	73	68	64	60	72	76	77	73
23	52	54	58	60	65	54	56	62	61	69	69	63	55	72	78	80	73	69	63	59	73	76	75	72
24	52	54	58	61	65	56	58	63	60	66	68	63	55	72	77	78	73	69	61	59	72	79	74	73
25	53	55	57	60	66	55	56	60	63	68	68	63	55	73	78	77	73	69	61	56	73	75	73	72
26	52	54	57	62	66	56	55	60	63	69	70	63	54	72	76	76	73	68	61	56	72	75	73	70
27	53	55	56	62	66	57	54	61	63	69	70	61	53	72	76	76	73	68	61	56	72	75	75	71
28	53	54	55	62	66	56	56	61	62	69	71	62	53	72	76	76	74	68	62	56	73	75	75	72
29	53		55	63	65	55	57	60	62	70	69	61	53	73	76	76	74	66	63	57	73	75	73	72
30	53		58	63	67	55		60	62	70	69	62	53	73	78	78	72	64	60	55	73	75	73	70
31	52		56		67	58		61		70	65		54		78	75		63		56		77	75	
Min.	52	52	53	56	62	54	54	55	60	62	65	61	53	68	72	75	72	63	60	55	67	73	73	70
Max.	55	55	58	63	67	58	60	65	63	70	72	66	62	73	79	81	77	73	68	65	73	79	79	77
Avg.	53	53	55	59	64	55	56	59	62	66	70	64	56	71	75	78	74	70	63	59	70	75	76	74

Effluent Temp
2 years daily

Effluent pH (s.u.)

90% pH = 6.4 **10% pH = 6.0**

Date	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12
1	6.0	6.4	6.1	6.3	6.5	6.3	6.1	6.2	6.7	6.3	6.0	6.1	6.0	6.3	6.2	6.2	6.2	6.3	6.3	6.1	6.0	6.3	6.3	6.1
2	6.0	6.0	6.0	6.3	6.5	6.3	6.1	6.2	6.6	6.2	6.0	6.1	6.2	6.2	6.1	6.1	6.3	6.2	6.3	6.3	6.3	6.1	6.3	6.1
3	6.2	6.0	6.0	6.2	6.5	6.2	6.1	6.2	6.4	6.3	6.2	6.1	6.2	6.4	6.2	6.3	6.2	6.4	6.3	6.1	6.1	6.1	6.2	6.1
4	6.1	6.0	6.0	6.4	6.3	6.2	6.2	6.1	6.4	6.4	6.3	6.2	6.0	6.5	6.3	6.3	6.3	6.4	6.2	6.2	6.4	6.1	6.2	6.0
5	6.1	6.3	6.0	6.2	6.3	6.3	6.2	6.0	6.4	6.5	6.3	6.2	6.1	6.3	6.2	6.1	6.2	6.3	6.1	6.2	6.5	6.3	6.4	6.2
6	6.0	6.0	6.0	6.1	6.3	6.3	6.2	6.1	6.4	6.4	6.3	6.2	6.2	6.4	6.2	6.2	6.2	6.4	6.1	6.2	6.5	6.2	6.3	6.1
7	6.0	6.1	6.0	6.3	6.2	6.3	6.1	6.1	6.5	6.5	6.3	6.1	6.2	6.4	6.1	6.2	6.1	6.3	6.1	6.3	6.5	6.2	6.2	6.2
8	6.0	6.3	6.0	6.3	6.4	6.3	6.1	6.1	6.5	6.4	6.2	6.2	6.1	6.4	6.2	6.1	6.3	6.3	6.1	6.2	6.5	6.5	6.0	6.5
9	6.0	6.0	6.1	6.3	6.2	6.3	6.1	6.1	6.3	6.5	6.1	6.2	6.2	6.4	6.2	6.2	6.3	6.2	6.2	6.2	6.7	6.5	6.3	6.5
10	6.0	6.0	6.1	6.3	6.1	6.2	6.1	6.2	6.2	6.4	6.1	6.2	6.3	6.4	6.2	6.1	6.3	6.3	6.3	6.1	6.7	6.0	6.4	6.5
11	6.1	6.1	6.1	6.3	6.2	6.1	6.1	6.1	6.3	6.4	6.0	6.3	6.2	6.3	6.2	6.1	6.3	6.4	6.4	6.2	6.7	6.2	6.5	6.4
12	6.1	6.0	6.1	6.3	6.2	6.3	6.2	6.1	6.3	6.3	6.1	6.4	6.2	6.3	6.2	6.1	6.3	6.4	6.4	6.2	6.8	6.1	6.5	6.2
13	6.4	6.1	6.0	6.2	6.2	6.1	6.1	6.3	6.4	6.4	6.0	6.4	6.2	6.3	6.2	6.3	6.2	6.4	6.3	6.1	6.7	6.1	6.1	6.3
14	6.4	6.1	6.0	6.2	6.3	6.2	6.2	6.2	6.4	6.3	6.0	6.4	6.2	6.5	6.2	6.2	6.4	6.4	6.1	6.2	6.6	6.2	6.1	6.4
15	6.1	6.1	6.1	6.2	6.3	6.3	6.1	6.2	6.4	6.3	6.0	6.4	6.2	6.3	6.2	6.2	6.3	6.3	6.3	6.1	6.7	6.4	6.0	6.3
16	6.0	6.0	6.0	6.1	6.3	6.2	6.1	6.3	6.2	6.2	6.2	6.5	6.3	6.3	6.2	6.1	6.4	6.3	6.3	6.0	6.5	6.3	6.1	6.4
17	6.1	6.1	6.1	6.2	6.3	6.3	6.2	6.3	6.3	6.2	6.2	6.4	6.3	6.2	6.1	6.2	6.2	6.3	6.3	6.0	6.6	6.2	6.2	6.1
18	6.1	6.0	6.0	6.3	6.3	6.2	6.2	6.3	6.4	6.3	6.1	6.3	6.1	6.4	6.1	6.2	6.2	6.3	6.3	6.0	6.5	6.2	6.3	6.0
19	6.0	6.0	6.0	6.3	6.4	6.1	6.2	6.2	6.2	6.3	6.1	6.3	6.0	6.4	6.0	6.3	6.5	6.4	6.1	6.0	6.6	6.2	6.2	7.0
20	6.0	6.1	6.0	6.3	6.4	6.1	6.2	6.2	6.2	6.3	6.0	6.1	6.1	6.4	6.0	6.3	6.5	6.5	6.1	6.0	6.5	6.3	6.2	6.3
21	6.0	6.1	6.1	6.5	6.4	6.2	6.1	6.2	6.2	6.2	6.0	6.1	6.2	6.3	6.1	6.3	6.4	6.3	6.2	6.0	6.3	6.1	6.2	6.6
22	6.1	6.2	6.1	6.2	6.4	6.3	6.2	6.2	6.3	6.2	6.0	6.1	6.2	6.3	6.2	6.2	6.3	6.6	6.3	6.0	6.2	6.2	6.1	6.4
23	6.3	6.1	6.1	6.3	6.3	6.3	6.1	6.0	6.2	6.2	6.0	6.1	6.1	6.1	6.1	6.2	6.4	6.2	6.2	6.1	6.3	6.3	6.0	6.4
24	6.2	6.0	6.2	6.3	6.4	6.2	6.2	6.3	6.1	6.2	6.1	6.1	6.1	6.1	6.0	6.3	6.7	6.3	6.2	6.2	6.2	6.1	6.4	6.3
25	6.2	6.0	6.0	6.3	6.4	6.2	6.2	6.3	6.2	6.2	6.0	6.2	6.4	6.3	6.2	6.3	6.1	6.2	6.8	6.1	6.2	6.3	6.4	6.4
26	6.1	6.0	6.0	6.2	6.4	6.3	6.2	6.1	6.3	6.0	6.0	6.2	6.1	6.2	6.3	6.1	6.4	6.4	6.1	6.1	6.3	6.4	6.3	6.5
27	6.1	6.0	6.1	6.3	6.4	6.3	6.2	6.2	6.5	6.1	6.0	6.2	6.4	6.2	6.1	6.3	6.2	6.3	6.1	6.0	6.2	6.2	6.1	6.2
28	6.0	6.0	6.3	6.6	6.3	6.3	6.2	6.5	6.4	6.0	6.1	6.3	6.4	6.2	6.1	6.1	6.2	6.5	6.2	6.0	6.0	6.1	6.2	6.3
29	6.2	6.1	6.3	6.3		6.4	6.2	6.5	6.4	6.1	6.2	6.2	6.3	6.0	6.2	6.1	6.2	6.4	6.3	6.1	6.1	6.3	6.1	6.4
30	6.2	6.0	6.3	6.4		6.3	6.2	6.5	6.3	6.0	6.1	6.1	6.3	6.1	6.2	6.2		6.4	6.3	6.0	6.1	6.3	6.3	6.3
31	6.0		6.3	6.4		6.1		6.5		6.0	6.1		6.3		6.2	6.2		6.3		6.0		6.1	6.2	
Min.	6.0	6.0	6.0	6.1	6.1	6.1	6.1	6.0	6.1	6.0	6.0	6.1	6.0	6.0	6.0	6.1	6.1	6.2	6.1	6.0	6.0	6.0	6.0	6.0
Max.	6.4	6.4	6.3	6.6	6.5	6.4	6.2	6.5	6.7	6.5	6.3	6.5	6.4	6.5	6.3	6.3	6.7	6.6	6.8	6.3	6.8	6.5	6.5	7.0
Avg.	6.1	6.1	6.1	6.3	6.3	6.2	6.2	6.2	6.3	6.3	6.1	6.2	6.2	6.3	6.2	6.2	6.3	6.3	6.2	6.1	6.4	6.2	6.2	6.3

Danville Northside Waste Water Treatment Plant
VA0060593

TMP hardness data

date	(mg/L)
2/7/2006	108
2/8/2006	72
2/10/2006	76
2/13/2007	64
2/14/2007	60
2/16/2007	64
2/5/2008	64
2/6/2008	68
2/8/2008	72
2/4/2009	76
2/5/2009	72
2/6/2009	72
3/16/2010	80
3/17/2010	100
3/19/2010	130

mean harndess = 78.5

EPA Form 2A application data summary - Outfall 001 **VPDES VA0060593**
Danville City - Northside

	Chromium III	Copper	Nickel	Silver	Zinc
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
10/30/2007	0.002	0.015	0.012	<0.001	0.097
12/15/2009	0.001	0.006	<0.005	0.001	0.074
11/15/2010	0.001	0.006	0.006	0.004	0.077
11/17/2010	0.002	0.009	0.016	0.004	0.104
11/19/2010	0.002	0.009	0.014	0.004	0.109
9/14/2011	0.002	0.011	0.014	0.001	0.208
9/20/2011	0.001	0.009	0.024	0.002	0.193

	Cyanide	$NO_2 + NO_3$	Total Phosphorus	Hardness	Total Dissolved Solids
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
10/30/2007	0.010				
8/12/2010		13.02	9.32		
9/14/2011	0.007	2.13	3.75	255	1740
9/19/2011				294	2380
9/20/2011	0.020	10.9	3.34	259	2600

Additional $NO_2 + NO_3$ data

165 samples	average	maximum
	(mg/L)	(mg/L)
Jan 2008 - Aug 2011	2.34	5.12

Additional Total Phosphorus data

151 samples	average	maximum
	(mg/L)	(mg/L)
Jan 2008 - Aug 2011	2.87	3.31

E. coli data	(mpn)
9/8/2011	> 200.5
9/15/2011	5.3
9/22/2011	<1.0
9/29/2011	1.0

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Danville's Northside WWTP Permit No.: VA0060593

Receiving Stream: Dan (Roanoke) River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		
Mean Hardness (as CaCO3) =	22.4	mg/L
90% Temperature (Annual) =	27.2	deg C
90% Temperature (Wet season) =	19.4	deg C
90% Maximum pH =	8.4	SU
10% Maximum pH =	7	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	n	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows		
1Q10 (Annual) =	114	MGD
7Q10 (Annual) =	188	MGD
30Q10 (Annual) =	243	MGD
1Q10 (Wet season) =	393	MGD
30Q10 (Wet season)	672	MGD
30Q5 =	422	MGD
Harmonic Mean =	905	MGD

Mixing Information		
Annual - 1Q10 Mix =	100	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	100	%
- 30Q10 Mix =	100	%

Effluent Information		
Mean Hardness (as CaCO3) =	78.5	mg/L
90% Temp (Annual) =	24.4	deg C
90% Temp (Wet season) =	18.3	deg C
90% Maximum pH =	6.4	SU
10% Maximum pH =	6	SU
Discharge Flow =	20	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	5	--	--	na	9.9E+02	--	--	na	2.2E+04	--	--	na	1.0E+02	--	--	na	2.2E+03	**--**	**--**	**na**	**2.2E+03**
Acrolein	0	--	--	na	9.3E+00	--	--	na	2.1E+02	--	--	na	9.3E-01	--	--	na	2.1E+01	**--**	**--**	**na**	**2.1E+01**
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	1.2E+02	--	--	na	2.5E-01	--	--	na	1.2E+01	**--**	**--**	**na**	**1.2E+01**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	2.0E+01	--	na	2.3E-02	7.5E-01	--	na	5.0E-05	5.0E+00	--	na	2.3E-03	**5.0E+00**	**--**	**na**	**2.3E-03**
Ammonia-N (mg/l) (Yearly)	0	2.95E+01	2.01E+00	na	--	1.97E+02	2.64E+01	na	--	7.37E+00	5.01E-01	na	--	4.94E+01	6.59E+00	na	--	**4.94E+01**	**6.59E+00**	**na**	**--**
Ammonia-N (mg/l) (High Flow)	0	1.60E+01	2.29E+00	na	--	3.31E+02	7.92E+01	na	--	4.01E+00	5.72E-01	na	--	8.28E+01	1.98E+01	na	--	**8.28E+01**	**1.98E+01**	**na**	**--**
Anthracene	0	--	--	na	4.0E+04	--	--	na	8.8E+05	--	--	na	4.0E+03	--	--	na	8.8E+04	**--**	**--**	**na**	**8.8E+04**
Antimony	0	--	--	na	6.4E+02	--	--	na	1.4E+04	--	--	na	6.4E+01	--	--	na	1.4E+03	**--**	**--**	**na**	**1.4E+03**
Arsenic	o	3.4E+02	1.5E+02	na	--	2.3E+03	1.6E+03	na	--	8.5E+01	3.8E+01	na	--	5.7E+02	3.9E+02	na	--	**5.7E+02**	**3.9E+02**	**na**	**--**
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	2.4E+04	--	--	na	5.1E+01	--	--	na	2.4E+03	**--**	**--**	**na**	**2.4E+03**
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	9.3E-02	--	--	na	2.0E-04	--	--	na	9.3E-03	**--**	**--**	**na**	**9.3E-03**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	8.3E+00	--	--	na	1.8E-02	--	--	na	8.3E-01	**--**	**--**	**na**	**8.3E-01**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	8.3E+00	--	--	na	1.8E-02	--	--	na	8.3E-01	**--**	**--**	**na**	**8.3E-01**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	8.3E+00	--	--	na	1.8E-02	--	--	na	8.3E-01	**--**	**--**	**na**	**8.3E-01**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	8.3E+00	--	--	na	1.8E-02	--	--	na	8.3E-01	**--**	**--**	**na**	**8.3E-01**
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	2.5E+02	--	--	na	5.3E-01	--	--	na	2.5E+01	**--**	**--**	**na**	**2.5E+01**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	1.4E+06	--	--	na	6.5E+03	--	--	na	1.4E+05	**--**	**--**	**na**	**1.4E+05**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	1.0E+03	--	--	na	2.2E+00	--	--	na	1.0E+02	**--**	**--**	**na**	**1.0E+02**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	6.5E+04	--	--	na	1.4E+02	--	--	na	6.5E+03	**--**	**--**	**na**	**6.5E+03**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	4.2E+04	--	--	na	1.9E+02	--	--	na	4.2E+03	**--**	**--**	**na**	**4.2E+03**
Cadmium	0	1.0E+00	4.2E-01	na	--	7.0E+00	4.3E+00	na	--	2.6E-01	1.0E-01	na	--	1.7E+00	1.1E+00	na	--	**1.7E+00**	**1.1E+00**	**na**	**--**
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	7.4E+02	--	--	na	1.6E+00	--	--	na	7.4E+01	**--**	**--**	**na**	**7.4E+01**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	1.6E+01	4.5E-02	na	3.7E-01	6.0E-01	1.1E-03	na	8.1E-04	4.0E+00	1.1E-02	na	3.7E-02	**4.0E+00**	**1.1E-02**	**na**	**3.7E-02**
Chloride	0	8.6E+05	2.3E+05	na	--	5.8E+06	2.4E+06	na	--	2.2E+05	5.8E+04	na	--	1.4E+06	6.0E+05	na	--	**1.4E+06**	**6.0E+05**	**na**	**--**
TRC	0	1.9E+01	1.1E+01	na	--	1.3E+02	1.1E+02	na	--	4.8E+00	2.8E+00	na	--	3.2E+01	2.9E+01	na	--	**3.2E+01**	**2.9E+01**	**na**	**--**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	3.5E+04	--	--	na	1.6E+02	--	--	na	3.5E+03	**--**	**--**	**na**	**3.5E+03**
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	6.0E+03	--	--	na	1.3E+01	--	--	na	6.0E+02	**--**	**--**	**na**	**6.0E+02**
Chloroform	0	--	--	na	1.1E+04	--	--	na	2.4E+05	--	--	na	1.1E+03	--	--	na	2.4E+04	**--**	**--**	**na**	**2.4E+04**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	3.5E+04	--	--	na	1.6E+02	--	--	na	3.5E+03	**--**	**--**	**na**	**3.5E+03**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	3.3E+03	--	--	na	1.5E+01	--	--	na	3.3E+02	**--**	**--**	**na**	**3.3E+02**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	5.6E-01	4.3E-01	na	--	2.1E-02	1.0E-02	na	--	1.4E-01	1.1E-01	na	--	**1.4E-01**	**1.1E-01**	**na**	**--**
Chromium III	0	2.2E+02	2.6E+01	na	--	1.5E+03	2.7E+02	na	--	5.4E+01	6.5E+00	na	--	3.6E+02	6.8E+01	na	--	**3.6E+02**	**6.8E+01**	**na**	**--**
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.1E+02	1.1E+02	na	--	4.0E+00	2.8E+00	na	--	2.7E+01	2.9E+01	na	--	**2.7E+01**	**2.9E+01**	**na**	**--**
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	1.0E+01	--	--	--	2.2E+02	--	**--**	**--**	**na**	**--**
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	8.3E-01	--	--	na	1.8E-03	--	--	na	8.3E-02	**--**	**--**	**na**	**8.3E-02**
Copper	0	4.4E+00	3.0E+00	na	--	3.0E+01	3.1E+01	na	--	1.1E+00	7.5E-01	na	--	7.4E+00	7.8E+00	na	--	**7.4E+00**	**7.8E+00**	**na**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	1.5E+02	5.4E+01	na	3.5E+05	5.5E+00	1.3E+00	na	1.6E+03	3.7E+01	1.4E+01	na	3.5E+04	**3.7E+01**	**1.4E+01**	**na**	**3.5E+04**
DDD [C]	0	--	--	na	3.1E-03	--	--	na	1.4E-01	--	--	na	3.1E-04	--	--	na	1.4E-02	**--**	**--**	**na**	**1.4E-02**
DDE [C]	0	--	--	na	2.2E-03	--	--	na	1.0E-01	--	--	na	2.2E-04	--	--	na	1.0E-02	**--**	**--**	**na**	**1.0E-02**
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	7.4E+00	1.0E-02	na	1.0E-01	2.8E-01	2.5E-04	na	2.2E-04	1.8E+00	2.6E-03	na	1.0E-02	**1.8E+00**	**2.6E-03**	**na**	**1.0E-02**
Demeton	0	--	1.0E-01	na	--	--	1.0E+00	na	--	--	2.5E-02	na	--	--	2.6E-01	na	--	**--**	**2.6E-01**	**na**	**--**
Diazinon	0	1.7E-01	1.7E-01	na	--	1.1E+00	1.8E+00	na	--	4.3E-02	4.3E-02	na	--	2.8E-01	4.4E-01	na	--	**2.8E-01**	**4.4E-01**	**na**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	8.3E+00	--	--	na	1.8E-02	--	--	na	8.3E-01	**--**	**--**	**na**	**8.3E-01**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	2.9E+04	--	--	na	1.3E+02	--	--	na	2.9E+03	**--**	**--**	**na**	**2.9E+03**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	2.1E+04	--	--	na	9.6E+01	--	--	na	2.1E+03	**--**	**--**	**na**	**2.1E+03**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	4.2E+03	--	--	na	1.9E+01	--	--	na	4.2E+02	**--**	**--**	**na**	**4.2E+02**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	1.3E+01	--	--	na	2.8E-02	--	--	na	1.3E+00	**--**	**--**	**na**	**1.3E+00**
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	7.9E+03	--	--	na	1.7E+01	--	--	na	7.9E+02	**--**	**--**	**na**	**7.9E+02**
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	1.7E+04	--	--	na	3.7E+01	--	--	na	1.7E+03	**--**	**--**	**na**	**1.7E+03**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	1.6E+05	--	--	na	7.1E+02	--	--	na	1.6E+04	**--**	**--**	**na**	**1.6E+04**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	2.2E+05	--	--	na	1.0E+03	--	--	na	2.2E+04	**--**	**--**	**na**	**2.2E+04**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	6.4E+03	--	--	na	2.9E+01	--	--	na	6.4E+02	**--**	**--**	**na**	**6.4E+02**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	6.9E+03	--	--	na	1.5E+01	--	--	na	6.9E+02	**--**	**--**	**na**	**6.9E+02**
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	9.7E+03	--	--	na	2.1E+01	--	--	na	9.7E+02	**--**	**--**	**na**	**9.7E+02**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	1.6E+00	5.8E-01	na	2.5E-02	6.0E-02	1.4E-02	na	5.4E-05	4.0E-01	1.5E-01	na	2.5E-03	**4.0E-01**	**1.5E-01**	**na**	**2.5E-03**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	9.7E+05	--	--	na	4.4E+03	--	--	na	9.7E+04	**--**	**--**	**na**	**9.7E+04**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	1.9E+04	--	--	na	8.5E+01	--	--	na	1.9E+03	**--**	**--**	**na**	**1.9E+03**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	2.4E+07	--	--	na	1.1E+05	--	--	na	2.4E+06	**--**	**--**	**na**	**2.4E+06**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	9.9E+04	--	--	na	4.5E+02	--	--	na	9.9E+03	**--**	**--**	**na**	**9.9E+03**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	1.2E+05	--	--	na	5.3E+02	--	--	na	1.2E+04	**--**	**--**	**na**	**1.2E+04**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	6.2E+03	--	--	na	2.8E+01	--	--	na	6.2E+02	**--**	**--**	**na**	**6.2E+02**
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	1.6E+03	--	--	na	3.4E+00	--	--	na	1.6E+02	**--**	**--**	**na**	**1.6E+02**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	1.1E-06	--	--	na	5.1E-09	--	--	na	1.1E-07	**--**	**--**	**na**	**1.1E-07**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	9.3E+01	--	--	na	2.0E-01	--	--	na	9.3E+00	**--**	**--**	**na**	**9.3E+00**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	1.5E+00	5.8E-01	na	2.0E+03	5.5E-02	1.4E-02	na	8.9E+00	3.7E-01	1.5E-01	na	2.0E+02	**3.7E-01**	**1.5E-01**	**na**	**2.0E+02**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	1.5E+00	5.8E-01	na	2.0E+03	5.5E-02	1.4E-02	na	8.9E+00	3.7E-01	1.5E-01	na	2.0E+02	**3.7E-01**	**1.5E-01**	**na**	**2.0E+02**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	1.5E+00	5.8E-01	--	--	5.5E-02	1.4E-02	--	--	3.7E-01	1.5E-01	--	--	**3.7E-01**	**1.5E-01**	**--**	**--**
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	2.0E+03	--	--	na	8.9E+00	--	--	na	2.0E+02	**--**	**--**	**na**	**2.0E+02**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	5.8E-01	3.7E-01	na	1.3E+00	2.2E-02	9.0E-03	na	6.0E-03	1.4E-01	9.4E-02	na	1.3E-01	**1.4E-01**	**9.4E-02**	**na**	**1.3E-01**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	6.6E+00	--	--	na	3.0E-02	--	--	na	6.6E-01	**--**	**--**	**na**	**6.6E-01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	4.6E+04	--	--	na	2.1E+02	--	--	na	4.6E+03	**--**	**--**	**na**	**4.6E+03**
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	3.1E+03	--	--	na	1.4E+01	--	--	na	3.1E+02	**--**	**--**	**na**	**3.1E+02**
Fluorene	0	--	--	na	5.3E+03	--	--	na	1.2E+05	--	--	na	5.3E+02	--	--	na	1.2E+04	**--**	**--**	**na**	**1.2E+04**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Guthion	0	--	1.0E-02	na	--	--	1.0E-01	na	--	--	2.5E-03	na	--	--	2.6E-02	na	--	**--**	**2.6E-02**	**na**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	3.5E+00	4.0E-02	na	3.7E-02	1.3E-01	9.5E-04	na	7.9E-05	8.7E-01	9.9E-03	na	3.7E-03	**8.7E-01**	**9.9E-03**	**na**	**3.7E-03**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	3.5E+00	4.0E-02	na	1.8E-02	1.3E-01	9.5E-04	na	3.9E-05	8.7E-01	9.9E-03	na	1.8E-03	**8.7E-01**	**9.9E-03**	**na**	**1.8E-03**
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	1.3E-01	--	--	na	2.9E-04	--	--	na	1.3E-02	**--**	**--**	**na**	**1.3E-02**
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	8.3E+03	--	--	na	1.8E+01	--	--	na	8.3E+02	**--**	**--**	**na**	**8.3E+02**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	2.3E+00	--	--	na	4.9E-03	--	--	na	2.3E-01	**--**	**--**	**na**	**2.3E-01**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	7.9E+00	--	--	na	1.7E-02	--	--	na	7.9E-01	**--**	**--**	**na**	**7.9E-01**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	6.4E+00	--	na	8.3E+01	2.4E-01	--	na	1.8E-01	1.6E+00	--	na	8.3E+00	**1.6E+00**	**--**	**na**	**8.3E+00**
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	2.4E+04	--	--	na	1.1E+02	--	--	na	2.4E+03	**--**	**--**	**na**	**2.4E+03**
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	1.5E+03	--	--	na	3.3E+00	--	--	na	1.5E+02	**--**	**--**	**na**	**1.5E+02**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.1E+01	na	--	--	5.0E-01	na	--	--	5.2E+00	na	--	**--**	**5.2E+00**	**na**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	8.3E+00	--	--	na	1.8E-02	--	--	na	8.3E-01	**--**	**--**	**na**	**8.3E-01**
Iron	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	4.4E+05	--	--	na	9.6E+02	--	--	na	4.4E+04	**--**	**--**	**na**	**4.4E+04**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	**--**	**0.0E+00**	**na**	**--**
Lead	0	2.7E+01	2.6E+00	na	--	1.8E+02	2.8E+01	na	--	6.6E+00	6.6E-01	na	--	4.4E+01	6.9E+00	na	--	**4.4E+01**	**6.9E+00**	**na**	**--**
Malathion	0	--	1.0E-01	na	--	--	1.0E+00	na	--	--	2.5E-02	na	--	--	2.6E-01	na	--	**--**	**2.6E-01**	**na**	**--**
Manganese	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Mercury	0	1.4E+00	7.7E-01	- -	- -	9.4E+00	8.0E+00	- -	- -	3.5E-01	1.9E-01	- -	--	2.3E+00	2.0E+00	- -	--	**2.3E+00**	**2.0E+00**	**- -**	**- -**
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	3.3E+04	--	--	na	1.5E+02	--	--	na	3.3E+03	**--**	**--**	**na**	**3.3E+03**
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	2.7E+05	--	--	na	5.9E+02	--	--	na	2.7E+04	**--**	**--**	**na**	**2.7E+04**
Methoxychlor	0	--	3.0E-02	na	--	--	3.1E-01	na	--	--	7.5E-03	na	--	--	7.8E-02	na	--	**--**	**7.8E-02**	**na**	**--**
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	**--**	**0.0E+00**	**na**	**--**
Nickel	0	6.7E+01	6.9E+00	na	4.6E+03	4.5E+02	7.1E+01	na	1.0E+05	1.7E+01	1.7E+00	na	4.6E+02	1.1E+02	1.8E+01	na	1.0E+04	**1.1E+02**	**1.8E+01**	**na**	**1.0E+04**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	1.5E+04	--	--	na	6.9E+01	--	--	na	1.5E+03	**--**	**--**	**na**	**1.5E+03**
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	1.4E+03	--	--	na	3.0E+00	--	--	na	1.4E+02	**--**	**--**	**na**	**1.4E+02**
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	2.8E+03	--	--	na	6.0E+00	--	--	na	2.8E+02	**--**	**--**	**na**	**2.8E+02**
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	2.4E+02	--	--	na	5.1E-01	--	--	na	2.4E+01	**--**	**--**	**na**	**2.4E+01**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.9E+02	6.9E+01	na	--	7.0E+00	1.7E+00	--	--	4.7E+01	1.7E+01	--	--	**4.7E+01**	**1.7E+01**	**na**	**--**
Parathion	0	6.5E-02	1.3E-02	na	--	4.4E-01	1.4E-01	na	--	1.6E-02	3.3E-03	na	--	1.1E-01	3.4E-02	na	--	**1.1E-01**	**3.4E-02**	**na**	**--**
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	1.5E-01	na	3.0E-02	--	3.5E-03	na	6.4E-05	--	3.6E-02	na	3.0E-03	**--**	**3.6E-02**	**na**	**3.0E-03**
Pentachlorophenol [C]	0	6.0E+00	5.1E+00	na	3.0E+01	4.0E+01	5.3E+01	na	1.4E+03	1.5E+00	1.3E+00	na	3.0E+00	1.0E+01	1.3E+01	na	1.4E+02	**1.0E+01**	**1.3E+01**	**na**	**1.4E+02**
Phenol	0	--	--	na	8.6E+05	--	--	na	1.9E+07	--	--	na	8.6E+04	--	--	na	1.9E+06	**--**	**--**	**na**	**1.9E+06**
Pyrene	0	--	--	na	4.0E+03	--	--	na	8.8E+04	--	--	na	4.0E+02	--	--	na	8.8E+03	**--**	**--**	**na**	**8.8E+03**
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	1.3E+02	5.2E+01	na	9.3E+04	5.0E+00	1.3E+00	na	4.2E+02	3.4E+01	1.3E+01	na	9.3E+03	**3.4E+01**	**1.3E+01**	**na**	**9.3E+03**
Silver	0	4.5E-01	--	na	--	3.0E+00	--	na	--	1.1E-01	--	na	--	7.6E-01	--	na	--	**7.6E-01**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	1.9E+03	--	--	na	4.0E+00	--	--	na	1.9E+02	**--**	**--**	**na**	**1.9E+02**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	1.5E+03	--	--	na	3.3E+00	--	--	na	1.5E+02	**--**	**--**	**na**	**1.5E+02**
Thallium	0	--	--	na	4.7E-01	--	--	na	1.0E+01	--	--	na	4.7E-02	--	--	na	1.0E+00	**--**	**--**	**na**	**1.0E+00**
Toluene	0	--	--	na	6.0E+03	--	--	na	1.3E+05	--	--	na	6.0E+02	--	--	na	1.3E+04	**--**	**--**	**na**	**1.3E+04**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	4.9E+00	2.1E-03	na	1.3E-01	1.8E-01	5.0E-05	na	2.8E-04	1.2E+00	5.2E-04	na	1.3E-02	**1.2E+00**	**5.2E-04**	**na**	**1.3E-02**
Tributyltin	0	4.6E-01	7.2E-02	na	--	3.1E+00	7.5E-01	na	--	1.2E-01	1.8E-02	na	--	7.7E-01	1.9E-01	na	--	**7.7E-01**	**1.9E-01**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	1.5E+03	--	--	na	7.0E+00	--	--	na	1.5E+02	**--**	**--**	**na**	**1.5E+02**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	7.4E+03	--	--	na	1.6E+01	--	--	na	7.4E+02	**--**	**--**	**na**	**7.4E+02**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	1.4E+04	--	--	na	3.0E+01	--	--	na	1.4E+03	**--**	**--**	**na**	**1.4E+03**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	1.1E+03	--	--	na	2.4E+00	--	--	na	1.1E+02	**--**	**--**	**na**	**1.1E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	1.1E+03	--	--	na	2.4E+00	--	--	na	1.1E+02	**--**	**--**	**na**	**1.1E+02**
Zinc	0	4.3E+01	4.0E+01	na	2.6E+04	2.9E+02	4.2E+02	na	5.7E+05	1.1E+01	1.0E+01	na	2.6E+03	7.2E+01	1.0E+02	na	5.7E+04	**7.2E+01**	**1.0E+02**	**na**	**5.7E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	1.4E+03
Arsenic	2.3E+02
Barium	na
Cadmium	6.5E-01
Chromium III	4.1E+01
Chromium VI	1.1E+01
Copper	3.0E+00
Iron	na
Lead	4.1E+00
Manganese	na
Mercury	9.4E-01
Nickel	1.1E+01
Selenium	7.8E+00
Silver	3.0E-01
Zinc	2.9E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

Facility = Danville's Northside WWTP

Chemical = Ammonia high flow Jan - May
Chronic averaging period = 30
WLAa = 82.8
WLAc = 19.8
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:
observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are: 9

Facility = Danville's Northside WWTP

Chemical = Ammonia low flow Jun - Dec
Chronic averaging period = 30
WLAa = 49.4
WLAc = 6.59
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:
observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 13.2964459156135
Average Weekly Limit = **13**.2964459156135
Average Monthly Limit = **13**.2964459156135

The data are: 9

10/16/2013 3:51:04 PM

Facility = Danville's Northside WWTP
Chemical = Chlorine, total residual (mg/L)
Chronic averaging period = 4
WLAa = 0.032
WLAc = 0.029
Q.L. = 0.1
# samples/mo. = 360
# samples/wk. = 84

Summary of Statistics:

observations = 1
Expected Value = 20
Variance = 144
C.V. = 0.6
97th percentile daily values = 48.6683
97th percentile 4 day average = 33.2758
97th percentile 30 day average= 24.1210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 0.032
Average Weekly limit = 1.48397544454242E-02
Average Monthly LImit = 1.39324377402559E-02

The data are:

20

10/15/2013 4:41:38 PM

Facility = Danville NorthsideWWTP
Chemical = Chromium III
Chronic averaging period = 4
WLAa = 360
WLAc = 68
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 8
Expected Value = 1.625
Variance = .950625
C.V. = 0.6
97th percentile daily values = 3.95430
97th percentile 4 day average = 2.70365
97th percentile 30 day average= 1.95983
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

2
1
1
2
2
2
2
1

10/15/2013 4:46:21 PM

Facility = Danville NorthsideWWTP
Chemical = Copper, total
Chronic averaging period = 4
WLAa = 7.4
WLAc = 7.8
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 7
Expected Value = 9.28571
Variance = 31.0408
C.V. = 0.6
97th percentile daily values = 22.5960
97th percentile 4 day average = 15.4494
97th percentile 30 day average= 11.1990
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 7.4
Average Weekly limit = 7.4
Average Monthly LImit = 7.4

The data are:

15
6
6
9
9
11
9

10/15/2013 4:51:15 PM

Facility = Danville NorthsideWWTP
Chemical = Nickel, total
Chronic averaging period = 4
WLAa = 110
WLAc = 18
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 7
Expected Value = 2.12254
Variance = 1.62187
C.V. = 0.6
97th percentile daily values = 5.16504
97th percentile 4 day average = 3.53147
97th percentile 30 day average= 2.55990
< Q.L. = 1
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

12
0
6
16
14
14
24

10/15/2013 4:55:08 PM

Facility = Danville NorthsideWWTP
Chemical = Silver, total
Chronic averaging period = 4
WLAa = 0.76
WLAc =
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 7
Expected Value = 2.12254
Variance = 1.62187
C.V. = 0.6
97th percentile daily values = 5.16504
97th percentile 4 day average = 3.53147
97th percentile 30 day average= 2.55990
< Q.L. = 1
Model used = BPJ Assumptions, Type 1 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 0.76
Average Weekly limit = 0.76
Average Monthly LImit = 0.76

The data are:

0
1
4
4
4
1
2

10/15/2013 4:58:34 PM

Facility = Danville Northside WWTO
Chemical = Zinc, total
Chronic averaging period = 4
WLAa = 72
WLAc = 100
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 7
Expected Value = 123.142
Variance = 5459.09
C.V. = 0.6
97th percentile daily values = 299.657
97th percentile 4 day average = 204.883
97th percentile 30 day average= 148.516
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 72
Average Weekly limit = 72.0000000000001
Average Monthly LImit = 72.0000000000001

The data are:

97
74
77
104
109
208
193

10/15/2013 5:05:15 PM

Facility = Danville Northside WWTO
Chemical = Cyanide
Chronic averaging period = 4
WLAa = 37
WLAc = 14
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 12.3333
Variance = 54.76
C.V. = 0.6
97th percentile daily values = 30.0121
97th percentile 4 day average = 20.5200
97th percentile 30 day average= 14.8746
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 20.4760469767452
Average Weekly limit = 20.4760469767452
Average Monthly LImit = 20.4760469767452

The data are:

10
7
20

10/16/2013 10:56:36 AM

Facility = Danville's Northside WWTP
Chemical = Antimony (ug/L)
Chronic averaging period = 4
WLAa = 1400
WLAc = 1400
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 23.3333
Variance = 196
C.V. = 0.6
97th percentile daily values = 56.7797
97th percentile 4 day average = 38.8217
97th percentile 30 day average= 28.1412
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

47
11
12

10/16/2013 11:06:18 AM

Facility = Danville's Northside WWTP
Chemical = Bromoform (ug/L)
Chronic averaging period = 4
WLAa = 6500
WLAc = 6500
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 7.44178
Variance = 19.9368
C.V. = 0.6
97th percentile daily values = 18.1089
97th percentile 4 day average = 12.3815
97th percentile 30 day average= 8.97518
< Q.L. = 1
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

104
0
275

10/16/2013 11:08:53 AM

Facility = Danville's Northside WWTP
Chemical = Chlorodibromomethane (ug/L)
Chronic averaging period = 4
WLAa = 600
WLAc = 600
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 24.6666
Variance = 219.04
C.V. = 0.6
97th percentile daily values = 60.0242
97th percentile 4 day average = 41.0401
97th percentile 30 day average= 29.7493
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

18
6
50

10/16/2013 11:15:19 AM

Facility = Danville's Northside WWTP
Chemical = Chloroform (ug/L)
Chronic averaging period = 4
WLAa = 24000
WLAc = 24000
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 4.63874
Variance = 7.74646
C.V. = 0.6
97th percentile daily values = 11.2880
97th percentile 4 day average = 7.71789
97th percentile 30 day average= 5.59457
< Q.L. = 2
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
11
0

10/16/2013 11:27:22 AM

Facility = Danville's Northside WWTP
Chemical = Dichlorobromomethane (ug/L)
Chronic averaging period = 4
WLAa = 790
WLAc = 790
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 4.63874
Variance = 7.74646
C.V. = 0.6
97th percentile daily values = 11.2880
97th percentile 4 day average = 7.71789
97th percentile 30 day average= 5.59457
< Q.L. = 2
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
8
0

Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 01/10/05
File: WETLIM10.xls
(MIX.EXE required also)

Enter data in the cells with blue type:

Entry Date:
Facility Name: Northside WWTP
VPDES Number: VA0060593
Outfall Number: 001

Acute Endpoint/Permit Limit

ACUTE 1.567044315 **TUa**

ACUTE WLAa 3.21428574

Use as LC_{50} in Special Condition, as TUa on DMR

LC_{50} = 64 % Use as **1.56** **TUa**

Note: Inform the permittee that if the mean of the data exceeds this TUa: 1.0 a limit may result using WLA.EXE

Chronic Endpoint/Permit Limit

CHRONIC 15.67044315 **TU_c**
BOTH* 32.14285815 **TU_c**
AML 15.67044315 **TU_c**

WLAa,c 574
CHRONIC WLAc 10.7142858
* Both means acute expressed as chronic

Use as NOEC in Special Condition, as TUc on DMR

NOEC = 7 % Use as **14.28** **TU_c**
NOEC = 4 % Use as **25.00** **TU_c**
NOEC = 7 % Use as **14.28** **TU_c**

Note: Inform the permittee that if the mean of the data exceeds this TUc: 6.4396851 a limit may result using WLA.EXE

% Flow to be used from MIX.EXE

Plant Flow:	20 MGD		
Acute 1Q10:	173 MGD	100 %	
Chronic 7Q10:	288 MGD	100 %	

Difuser /modeling study?

Enter Y/N Y
Acute 10.714286 :1
Chronic 10.714286 :1

Are data available to calculate CV? (Y/N) N (Minimum of 10 data points, same species, needed) Go to Page 2
Are data available to calculate ACR? (Y/N) N (NOEC<LC50, do not use greater/less than data) Go to Page 3

NOTE: If the IWCa is >33%, specify the NOAEC = 100% test/endpoint for use

IWC_a	9.33333327 %	Plant flow/plant flow + 1Q10	
IWC_c	9.33333327 %	Plant flow/plant flow + 7Q10	
Dilution, acute	10.71428579	100/IWCa	
Dilution, chronic	10.71428579	100/IWCc	
WLA_a	3.214285736	Instream criterion (0.3 TUa) X's Dilution, acute	
WLA_c	10.71428579	Instream criterion (1.0 TUc) X's Dilution, chronic	
$WLA_{a,c}$	32.14285736	ACR X's WLA_a - converts acute WLA to chronic units	
ACR -acute/chronic ratio	10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)	
CV-Coefficient of variation	0.6	Default of 0.6 - if data are available, use tables Page 2)	
Constants eA	0.4109447	Default = 0.41	
eB	0.6010373	Default = 0.60	
eC	2.4334175	Default = 2.43	
eD	2.4334175	Default = 2.43 (1 samp) No. of samples: 1	

****The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.**

$LTA_{a,c}$	13.20893688	WLAa,c X's eA				
LTA_c	6.439685401	WLAc X's eB				
MDL** with $LTA_{a,c}$	32.14285815	TU_c	NOEC =	3.111111	(Protects from acute/chronic toxicity)	Rounded NOEC's %
MDL** with LTA_c	15.67044315	TU_c	NOEC =	6.381440	(Protects from chronic toxicity)	NOEC = 4 %
AML with lowest LTA	15.67044315	TU_c	NOEC =	6.381440	Lowest LTA X's eD	NOEC = 7 %

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a

MDL with $LTA_{a,c}$	3.214285815	TU_a	LC50 =	31.111110	%	Rounded LC50's %
MDL with LTA_c	1.567044315	TU_a	LC50 =	63.814405	%	LC50 = 32 %
						LC50 = 64

Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">") FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE 'CV' WILL BE PICKED UP FOR THE CALCULATIONS BELOW. THE DEFAULT VALUES FOR eA, eB, AND eC WILL CHANGE IF THE 'CV' IS ANYTHING OTHER THAN 0.6.

Coefficient of Variation for effluent tests

CV = 0.6 (Default 0.6)

δ^2 = 0.3074847

δ = 0.554513029

Using the log variance to develop eA

(P. 100, step 2a of TSD)

Z = 1.881 (97% probability stat from table

A = -0.889296658

eA = 0.410944686

Using the log variance to develop eB

(P. 100, step 2b of TSD)

δ_4^2 = 0.086177696

δ_4 = 0.293560379

B = -0.509098225

eB = 0.601037335

Using the log variance to develop eC

(P. 100, step 4a of TSD)

δ^2 = 0.3074847

δ = 0.554513029

C = 0.889296658

eC = 2.433417525

Using the log variance to develop eD

(P. 100, step 4b of TSD)

n = 1 This number will most likely stay as "1", for 1 sample/month.

δ_n^2 = 0.3074847

δ_n = 0.554513029

D = 0.889296658

eD = 2.433417525

	Vertebrate IC_{25} Data or LC_{50} Data	LN of data	Invertebrate IC_{25} Data or LC_{50} Data	LN of data
	**********		**********	
1	0		1 0	
2	0		2 0	
3	0		3 0	
4	0		4 0	
5	0		5 0	
6	0		6 0	
7	0		7 0	
8	0		8 0	
9	0		9 0	
10	0		10 0	
11	0		11 0	
12	0		12 0	
13	0		13 0	
14	0		14 0	
15	0		15 0	
16	0		16 0	
17	0		17 0	
18	0		18 0	
19	0		19 0	
20	0		20 0	
St Dev	0	0	St Dev 0	0
Mean	0	0	Mean 0	0
Variance	0	0.000000	Variance 0	0.000000
CV	0		CV 0	

Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC_{50}, since the ACR divides the LC_{50} by the NOEC. LC_{50}'s >100% should not be used.

Table 1. ACR using Vertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Table 1. Result:	Vertebrate ACR	0
Table 2. Result:	Invertebrate ACR	0
	Lowest ACR	Default to 10

Table 2. ACR using Invertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Convert LC_{50}'s and NOEC's to Chronic TU's for use in WLA.EXE

Table 3. **ACR used: 10**

	Enter LC_{50}	TUc	Enter NOEC	TUc
1		NO DATA	41	2.439024
2		NO DATA	41	2.439024
3		NO DATA	41	2.439024
4		NO DATA	41	2.439024
5		NO DATA	100	1.000000
6		NO DATA	100	1.000000
7		NO DATA	100	1.000000
8		NO DATA	100	1.000000
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50,

enter it here:	NO DATA	$\%LC_{50}$
	NO DATA	TUa

DILUTION SERIES TO RECOMMEND

Table 4.

	Monitoring		Limit	
	% Effluent	TUc	% Effluent	TUc
Dilution series based on data mean	15.5	6.4396851		
Dilution series to use for limit			7	14.285714
Dilution factor to recommend:	0.3940648		0.264575131	
Dilution series to recommend:	100.0	1.00	100.0	1.00
	39.4	2.54	26.5	3.78
	15.5	6.44	7.0	14.29
	6.1	16.34	1.9	53.99
	2.41	41.47	0.5	204.08
Extra dilutions if needed	0.95	105.24	0.1	771.36
	0.37	267.05	0.0	2915.45

Cell: I9
Comment:
This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: K18
Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22
Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40
Comment:
If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41
Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48
Comment:
See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62
Comment:
Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62
Comment:
Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117
Comment: Vertebrates are:

Pimephales promelas
Cyprinodon variegatus

Cell: M119
Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121
Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUa. The calculation is the same: 100/NOEC = TUc or 100/LC50 = TUa.

Cell: C138
Comment: Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

Statistical Evaluation of need for WET Limit

Facility = Northside WWTP

Chemical = WET, chronic C. dubia water flea
Chronic averaging period = 4
WLAa = 32.1
WLAc = 10.7
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:
observations = 5
Expected Value = 3.128
Variance = 3.52237
C.V. = 0.6
97th percentile daily values = 7.61173
97th percentile 4 day average = 5.20433
97th percentile 30 day average= 3.77253
< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:
5.88
2.44
2.44
2.44
2.44

Northside WWTP **VPDES Permit VA0060593**

Stormwater data Summary

Monitoring event Sept. 16, 2008

Parameter (mg/L except as noted)	**benchmark value**	**Outfall 002**	**Outfall 003**	**Outfall 004**	**Outfall 005**
pH (S.U.)	6.0 - 9.0	8	6.9	6.8	8.3
Temperature (°C)(max)	32	21.5	21.5	22.0	20.5
Dissolved Oxygen	5	6.9	7.0	7.3	6.2
TSS	100	196/194	10/7	58/47	19/56
BOD_5	30	<4/<4	9/<4	8/11	<4/16
COD	120	<10/<10	36/16	36/53	<10/97
TKN	1.5	2.23/1.33	2.32/1.74	2.32/2.75	1.59/4.13
$NO_3 + NO_2$	2/3**	0.06/0.09	0.62/<0.05	0.82/1.44	2.60/2.82
Nitorgen, total	2.2	2.29/1.42	2.94/1.765	3.14/4.19	4.19/6.95
Phosphorus, total	35	2.39/0.53	0.28/0.24	0.70/1.00	0.61/1.53
Oil & Grease	10/15*	<5.0	<5.0	<5.0	<5.0
E. Coli (CFU/100 ml)$^{\delta}$	235	1240	4960	2180	300

Results are from grab/composite sample

Shaded values exceed benchmark listed

* values are limts in the IndSWGP for areas processing asphalt paving and roofing emulsions

** EPA value was 0.68 but not included in latest guidance. Rule of thumb is 2-3 mg/L goal

$^{\delta}$ maximum single sample of bacterial water quality std

VPDES Permit VA0060593
Danville – Northside WWTP
Reissuance 2014

ATTACHMENT C

- Public Notice for reissuance
- VDH Office of Water Programs Danville, January 23, 2012, application review memo
- EPA Review Checklist

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater and storm water into a water body in Danville, Virginia.

PUBLIC COMMENT PERIOD: April 18, 2014 to May 19, 2014

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater and Storm water issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: City of Danville, Danville Utilities, 279 Park Avenue, Danville, VA 24541; VA0060593

FACILITY NAME AND LOCATION: Danville - Northside Wastewater Treatment Plant, 229 Northside Drive, Danville, VA 24540

PROJECT DESCRIPTION: The City of Danville has applied for reissuance of a permit for the public Northside Waste Water Treatment Plant. The applicant proposes to release treated sewage wastewaters at a rate of 20 million gallons-per-day and storm water into a water body. Sludge from the treatment process will be disposed by land application by contractor to agricultural lands in North Carolina. The facility proposes to release the treated sewage and storm water in the Dan River, un-named tributaries to the Dan River and to Pumpkin Creek in Danville and Pittsylvania County in the Roanoke watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: nutrients, organic matter and solids.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing hand-delivery, by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: Susan Edwards; Blue Ridge Regional Office - Roanoke, 3019 Peters Creek Road, Roanoke, 24019; Phone: 540-562-6764; E-mail: Susan.Edwards@deq.virginia.gov. The public may review the draft permit and application at the DEQ office named above by appointment or may request copies of the documents from the contact person listed above.

MEMORANDUM

DATE: January 23, 2012

TO: Kirk Batsel, Senior Environmental Engineer
Lynchburg Office, Blue Ridge Region
7705 Timberlake Road
Lynchburg, Virginia 24502

FROM: Mitchell R. Childrey, P.E., Engineering Field Director
VDH-ODW-Danville Field Office

CITY/COUNTY: City of Danville

SUBJECT:
- ☒ VPDES Application No. VA0060593 ☒ Existing ☐ Proposed
- ☐ VWP Permit No. _____ ☐ Existing ☐ Proposed
- ☐ Other: _____

OWNER/APPLICANT: City of Danville

LOCATION OF DISCHARGE/ACTIVITY: City of Danville Northside Wastewater Treatment Plant

☒ There are no public water supply raw water intakes within 15 miles downstream of the discharge.

☐ The raw water intake for _____ waterworks is located _____ miles downstream from the discharge. We recommend a minimum Reliability Class _____ for this facility [which is] [the same as the existing Reliability Class] [more stringent than the existing Reliability Class].

☐ The raw water intake for _____ waterworks is located _____ miles downstream from the discharge.

☐ Please forward a copy of the Draft Permit for our review and comment.

☒ Other Comments: Permit issuance being requested for 12 MGD during interim period while wastewater plant is being modified and 20 MGD when all improvements completed (including conversion from pure oxygen activated sludge treatment with 24 MGD capacity to conventional aeration activated sludge treatment).

Reviewer: _____ 1/23/12

EPA Transmittal Checklist

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name: **Danville's Northside WWTP**

NPDES Permit Number: **VA0060593**

Permit Writer Name: Susan K. Edwards

Date: April 7, 2014

Major [**X**] **Minor** [ ] **Industrial** [ ] **Municipal** [**X**]

I.A. Draft Permit Package Submittal Includes:	**Yes**	**No**	**N/A**
1. Permit Application?	**X**		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	**X**		
3. Copy of Public Notice?	**X**		
4. Complete Fact Sheet?	**X**		
5. A Priority Pollutant Screening to determine parameters of concern?	**X**		
6. A Reasonable Potential analysis showing calculated WQBELs?	**X**		
7. Dissolved Oxygen calculations? *Copy of WQMP with allocations. Model not available.*		**X**	
8. Whole Effluent Toxicity Test summary and analysis?	**X**		
9. Permit Rating Sheet for new or modified industrial facilities?			**X**

I.B. Permit/Facility Characteristics	**Yes**	**No**	**N/A**
1. Is this a new or currently unpermitted facility?		**X**	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	**X**		
3. Does the fact sheet **or** permit contain a description of the wastewater treatment process?	**X**		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		**X**	
5. Has there been any change in streamflow characteristics since the last permit was developed?		**X**	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?	**X**		
7. Does the fact sheet **or** permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	**X**		
8. Does the facility discharge to a 303(d) listed water?	**X**		
a. Has a TMDL been developed and approved by EPA for the impaired water?	**X**	**X**	
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?	**X**	**X**	
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	**X**		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?	**X**		
10. Does the permit authorize discharges of storm water?	**X**		
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production? *Substantially altered – convert from oxygen to ambient air activated sludge.*	**X**		
12. Are there any production-based, technology-based effluent limits in the permit?	**X**		
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		**X**	

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist
Region III NPDES Permit Quality Checklist – for POTWs
(To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X		

II.C. Technology-Based Effluent Limits (POTWs)	Yes	No	N/A
1. Does the permit contain numeric limits for ALL of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			x
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?		X	
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?		X	
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined? *Result in monitoring for total metals evaluation.*		X	
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established? *Not pH or DO.*		X	
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?	X		

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?	X		
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations? *Specifically regarding stormwater.*	X		
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
a. Does the permit require implementation of the "Nine Minimum Controls"?			X
b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?	X		

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		

List of Standard Conditions – 40 CFR 122.41

Duty to comply	Property rights	Reporting Requirements
Duty to reapply	Duty to provide information	Planned change
Need to halt or reduce activity not a defense	Inspections and entry	Anticipated noncompliance
Duty to mitigate	Monitoring and records	Transfers
Proper O & M	Signatory requirement	Monitoring reports
Permit actions	Bypass	Compliance schedules
	Upset	24-Hour reporting
		Other non-compliance

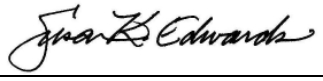
2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?	X		

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name Susan Edwards

Title Environmental Engineer Sr.

Signature 

Date April 7,2014